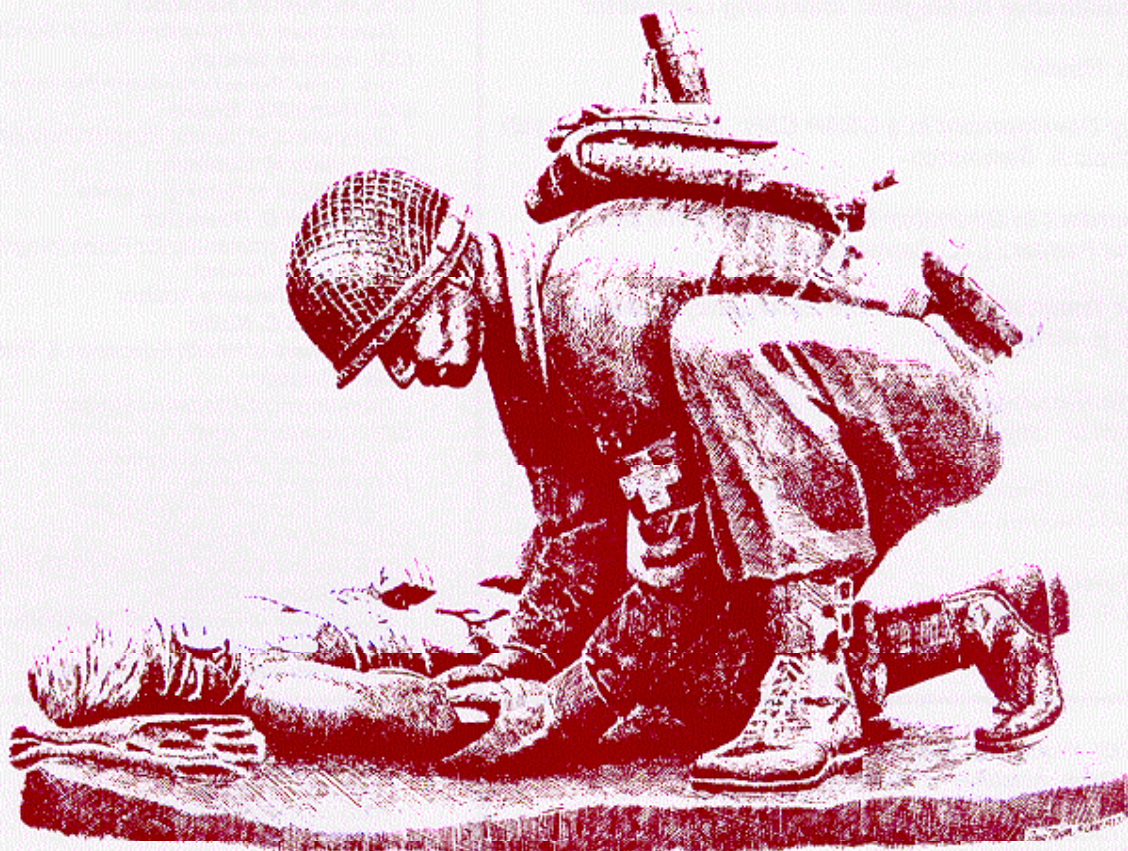


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March-April 1998



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Why Marketing Healthcare in the Military Can Help: A Historical Perspective

Formulary Development in a USAR CSH: A Team Approach

Psychiatric Nursing: A Critical Role in Deployment

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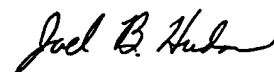
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Perspective

Army Values

Values are core beliefs that are fundamental to an organization and its members. Values form the very foundation on which units, activities, and policies are built.

The Army has a specific set of values that should be familiar to all in the Army Medical Department (AMEDD). They are easy to remember because they form the mnemonic "LEADERSHIP":

- Loyalty
- Duty
- Respect
- Selfless Service
- Honor
- Integrity
- Personal Courage

Evidence of these values can be found in the accomplishments and achievements of AMEDD personnel throughout the world. This issue of the AMEDD Journal is dedicated to Army values and the people behind them. Several of this month's articles illustrate one or more Army values and underscores the importance they take in Army life.

- *Sudden or Traumatic Death in the Emergency Department* - Describes a nurse's perspective on death in a major hospital emergency department. Victims' families are frequently overwhelmed by the unexpected loss of a loved one. *Respect* for their wishes and those of the deceased plays an important role in the eventual healing process.

- *Neurorehabilitative Strategies: Improving Locomotor Function* - Head and spinal injuries are among the most devastating of all traumas. Survivors are frequently left with significant neurologic damage, including brain damage and paraplegias. Few examples of *personal courage* are more dramatic than demonstrated by those faced with seemingly devastating injury. This article outlines approaches to rehabilitation from a neurobiology perspective and provides encouragement for veteran's injured in battle.

- *Sleep Disorders in Operation Desert Storm Veterans* - Describes the results of a study on day-time sleepiness and insomnia in 1,995 veterans of the

conflict in South-west Asia. This article serves as a reminder of the sacrifice and *selfless service* rendered by soldiers who willingly served their nation's call to arms and the burdens they may carry years later.



Major General James B. Peake

- *Formulary Development in a USAR CSII: A Team Approach* - Outlines a step-by-step method of developing and implementing a deployable hospital pharmaceutical formulary. The author emphasizes a team approach in accomplishing the mission. In this fashion, we are reminded that we in the AMEDD have a *duty* not only to our superiors, but also our colleagues and patients. Focusing on the mission and the customer gives the desired outcome.

- *Pretesting and Success in the Respiratory Specialist Course* - This article reports on a study correlating success in a respiratory therapy technician course and three precourse test scores. This article touches on the concept of *integrity* by highlighting the importance of standards and proficiency in healthcare training and patient care.

- *Psychiatric Nursing: A Critical Role in Deployment* - Describes a clinical nurse specialist's experience in two overseas deployments. Despite the hardships and obstacles, successes were achieved through long hours, hard work, and *loyalty* to the cause.

- *Why Marketing Healthcare in the Military Can Help: A Historical Perspective* - Provides a unique look at how military medicine presents itself. This article serves as a reminder of the importance of *honor* and pride in performing our everyday missions and in facing the future.

The Army reflects the great diversity and breadth of this great nation. Army values help to bring this broad spectrum of individuals into a cohesive, mutually supportive organization. Meet the challenges of today and tomorrow by drawing on the strength of Army values.

Why Marketing Healthcare in the Military Can Help: A Historical Perspective

LCDR E.C. Ehresmann†

(Note: This article was previously published in the July-August 1997 issue of Navy Medicine and is reprinted here with their permission.)

There is an old Chinese saying that a journey of a thousand miles begins with a single step. The year 1993 dawned with anticipation of sweeping change. A new President, William Jefferson Clinton, took office, and his administration undertook the task of realigning and streamlining the military to face new world challenges wrought by several years of geopolitical change. In a time of increased emphasis on reducing the Nation's budget deficit, controlling the costs of national medical programs, and changing our national military strategy, the Military Health Services System (MHSS) is part of this journey of change. Concurrently, President Clinton's Healthcare Reform Plan was being designed to provide a national healthcare system which ensured universal access while controlling the rate of increase in healthcare costs. Like every other facet of the medical community, military medicine has had to respond to the escalating demand for healthcare reform. These parameters, for example, cost containment and access to care, present the Department of Defense (DOD) and the Services with a unique opportunity to enhance the performance of the MHSS to ensure access to quality healthcare for beneficiaries while undertaking initiatives to enhance our system's cost-effectiveness.

It has been apparent for the past several years that the healthcare cost issue is becoming more prominent on the list of the nation's most pressing economic, social, and political problems. Within the military departments cost concern has been exacerbated by reductions in the defense appropriations provided by Congress. According to the U.S. General Accounting Office, CHAMPUS shortfalls from fiscal year 1985 through the mid-1990s totaled in excess of \$1.8 billion. Underestimating, under funding, carryovers, supplemental appropriations, and transfer authorities have tended to obscure and delay solutions to the

CHAMPUS problem. Just as the major employers in the United States are aggressively searching for solutions, even to the extent of advocating some form of health insurance, the military departments, the DOD, and Congress have been trying to develop programs which will reduce the impact of medical costs to the nation's defense expenditures.

High costs, wide beneficiary dissatisfaction, and inadequate readiness for war stirred widespread interest in changing the military's system of care. In 1990, the Assistant Secretary of Defense for Health Affairs proposed creating a system of coordinated care to address many of the problems confronting the delivery of DOD health services. It is expected that this coordinated care system will create a healthcare system that is managerially sound, eliminate much uncertainty in cost/demand, and introduce accountability to healthcare operations. In essence, this system will create a "health network" approach which encourages patients to use medical treatment facilities (MTFs) and preferred civilian networks who share the risks of unit cost and volume. The pace of change for the MHSS is swift and the path ahead is not without risk, but there is no question that the medical community of the Armed Forces can excel in this new environment, referred to as TRICARE, if the Services are not afraid to extend their horizons to new ideas, like marketing healthcare within the military medical departments.

In the past, MTFs have had a captured customer base and thus no inclination for a marketing orientation. Both civilian and military hospitals used to look askance at the idea of marketing, but they can no longer afford to do so. Staying in business has become a top priority. There is also growing public clamor to check runaway health costs by closing unneeded hospitals and restructuring expansion. Recognizing that it is too expensive to continue to attempt to be all things to all people, many hospitals, including MTFs, should see marketing strategies as the key to their economic survival.

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In today's healthcare environment, healthcare marketing can be a major management resource for MTFs if it is understood and applied effectively through the planning process. For healthcare executives to succeed in this ever-changing environment, they will need a clear grasp of those essential strategic concepts that lead down the pathway to growth. Unfortunately, there are still too many healthcare managers who allude to the need to "market" their organizations' services, while merely pursuing a few promotional activities in search of a quick fix. Clearly, few of the healthcare problems facing military and civilian hospitals are amenable to quick solutions. Most of these problems require a deep understanding of the environment, the market and the way it segments itself, and the organization's goals for each segment. Moreover, these problems require the healthcare manager to master well-established marketing concepts such as positioning, the marketing mix, channels management, consumer behavior, and marketing budgeting.

Consistent with the dynamics of National Healthcare Reform, the military healthcare system has embarked on a major program of healthcare reform, known as TRICARE. This program is designed to ensure the most effective execution of the military healthcare mission. It recognizes the need to ensure access to a secure, quality healthcare benefit, to control costs, and to respond to changing national military and healthcare priorities. In order to promote sound healthcare reform within the MHSS, the medical community must expand its knowledge base, including conceptual and schematic frameworks on the omnipotent marketing process.

Since marketing military healthcare is predominantly viewed as being in a preparadigmatic state, the development of marketing military healthcare epistemology has become a priority. Expository works examining and supporting the increased involvement of military healthcare in the marketing arena have surged over the last decade. Acknowledging the recency of marketing to the healthcare industry, specifically military healthcare, it is understandable that military healthcare databases and conceptual orientations are insufficient at this time. Thus, a critical and selective synthesis of research and conceptual viewpoints from strategic management theory may be beneficial. The value of studying strategic management theory and behavior comes less from any specific applications and more from how it shapes the way managers come to think about their jobs and the range of options to be considered. Appreciation of the theory of strategic management thus results less in a set of principles to be applied to

concrete problems—although there are some—and more to enhancing one's breadth of possibilities. Managers "satisfice"—to borrow a term from Herbert Simon—because they have neither the wits nor the time to find optimal solutions.

During the past 25 years, the military departments have experienced many changes. Probably the greatest change affecting healthcare delivery was the decision by the national leadership to adopt an all-volunteer force. While the predominantly drafted Armed Forces were composed of mostly single men and women, the all-volunteer force included a much larger number of family members, thereby significantly increasing total beneficiaries. This change occurred mainly during the 1970s. In addition, the number of military retirees increased at a greater rate than previously due to the larger career force which had entered active duty during World War II and the Korean War. Since the late 1950s, DOD has provided medical care to those who are unable to gain access to a military medical facility through CHAMPUS. This is a package of benefits roughly equivalent to the Blue Cross/Blue Shield High Option. Until 1987, CHAMPUS claims were paid by the Office of the Secretary of Defense and were not a major concern of the individual departments. As a result, there was no direct cost to the military departments if medical facilities referred patients to the civilian community under CHAMPUS when they experienced shortages in providers or budget authority.

Since 1986, the medical community of the Armed Forces has made progressive efforts to enhance regional coordination in the delivery of healthcare. In 1991, DOD mandated the implementation of a Coordinated Care Program designed to provide MTF commanders with the tools, authority, and flexibility needed to increase access to care and maximize effective use of resources while maintaining excellent quality care supported by comprehensive graduate medical education programs. A major intent of this agreement referred to as TRICARE was to establish a structure for joint planning, development, and coordination. The medical community of the Armed Forces have the opportunity to accomplish that goal which can provide beneficiaries with quality, cost-effective healthcare facilitated by a system which will provide a primary care manager and personal assistance through all phases of secondary and tertiary care.

In the past, MTFs have primarily operated individually because they had a captive customer base and thus no inclination for a marketing orientation. Change is occurring at an alarming rate for managers of healthcare in both the military and civilian sectors;

it seems depressingly slow for many outside the system. Military and civilian healthcare organizations look different from varying vantage points and the multiplicity and complexity of perspectives is a crucial aspect of the managerial challenge. Healthcare organizations must not only strive to attain reasonable levels of efficiency, quality, and even equity, but also convince their clients that they are doing so. If directing a healthcare organization was simply a technical task, management would be a snap, but all organizations and especially those dealing with human services, must function in changing social and symbolic contexts that affect internal processes as well as the environment and increase uncertainty and the importance of personality, leadership, and politics.

The medical community of the Armed Forces, like other healthcare organizations, is using a number of proactive, reactive, independent, and/or intradependent marketing efforts to influence policy development while attempting to eliminate apolitical images. The medical communities of the Armed Forces are becoming more and more actively involved in local, state, and national policies, and the 1990s have been deemed the decade of strengthening the medical functions of the DOD. Rubenstein, Tucker, and Crompton describe how marketing military medicine has made some inroads in pursuing the efficient conduct of healthcare operations and ensuring that the pool of consumers are satisfied. As national attention shifts from defense and foreign issues to domestic issues, it is projected that more members of the military healthcare community will become active participants in the marketing arena. Crompton and Lamb reveal that in the past, both military and civilian systems have offered their constituents standardized services. This has been termed the lowest common denominator approach to service delivery. Such a service seeks to

satisfy the maximum number of people at some minimal level.

In today's healthcare environment, marketing can be a major management resource for the medical communities of the Armed Forces if it is understood and applied effectively through the planning process. For healthcare executives to succeed in this ever-changing environment, they will need to elect from among three choices: (1) do nothing; (2) do the same thing harder; or (3) do something different. As Will Rogers once said, "Even if you are on the right track, you will get run over if you just sit there."

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Neurorehabilitative Strategies: Improving Locomotor Function

CPT Eric I. Hassid*

Traumatic injuries to the brain and spinal cord are still quite prevalent in the United States, despite many efforts to implement preventive safety measures. The advancement in acute and chronic medical management over the past two decades has allowed thousands of patients yearly to survive their neurological catastrophe. However, this medical milestone has posed a significant challenge to the rehabilitation community. Patients, now more than ever, are able to survive with significant neurological disability. Furthermore, increasing longevity has allowed patients to survive to an age where they are more likely to suffer from disabling neurological illnesses such as stroke.

Locomotor dysfunction causes significant disability in patients having suffered injuries to the brain and spinal cord. The type of observed abnormality depends on the nature of the injury as well as the neuroanatomical structures involved. Therefore, knowledge of normal locomotor control is essential to the approach of any patient with a neurological gait disorder. The neural control of a locomotion is extremely complex and the intricacies of this neural network have yet to be completely elucidated. A comprehensive overview of this topic is beyond the scope of this article and interested readers are referred to reference number 1. However, a brief overview will be provided.

Animal research has revealed that the neural control of a locomotion occurs at multiple levels within the central nervous system (CNS) and that this control is highly influenced by peripheral sensory feedback. Research in cats has revealed the presence of a (*central pattern generator*) in the spinal cord that is capable of producing primitive rhythmic stepping movements even in the absence of supraspinal input. This fictive locomotion can be generated in a spinalized cat suspended in a harness while on a moving treadmill by sensory stimulation to the tail. Stimulation of midbrain and pontine areas in decerebrated cats produces a fictive locomotion as well. The location of the stimulation in the pontine region determines

whether or not ipsilateral extension or flexion is emphasized. This is due to preferential stimulation of certain descending motor pathways such as vestibulospinal, reticulospinal, or rubrospinal tracts. Descending noradrenergic and serotonergic pathways modulate the excitability of the central pattern generator to supraspinal stimulation. The motor and supplementary motor cortices initiate and modulate a locomotion by activating brain stem or spinal locomotor centers. Corticospinal tract stimulation probably serves to fine tune locomotion by preventing contralateral mass synergy movements and by promoting individual single joint movement control, primarily at the ankle. Multiple parallel networks function in locomotor modulation. The cerebellum projects to the brain stem and cortex via the thalamus. It modulates stepping amplitude, rhythmicity, and foot placement. The basal ganglia projects to the midbrain locomotor center via the globus pallidus internus. It also projects to the supplementary motor cortex via the thalamus. These connections probably assist in gait initiation as well as directional changes. Balance control is essential for normal ambulation. Proprioceptive, vestibular, and visual input provide the essential sensory input to maintain upright balance control. The control of sensory information weighting and modulation as well as appropriate motor response strategy implementation occurs at multiple levels within the CNS (brain stem, basal ganglia, cerebellum, and cerebral cortex). The fact that lesions can occur at any point along this complex neuronal network account for the wide variety of balance and gait disorders that are frequently seen after injuries to the brain and spinal cord.

Locomotor recovery after injury to the CNS depends greatly on the nature and extent of the injury. Water et al found that initially complete paraplegic spinal cord injured patients had a 5% chance of regaining minimal motor function or in becoming community ambulators by 1 year.²⁻⁴ Incomplete paraplegic, on the other hand, had an 85% chance of regaining functional (>3/5) muscle strength in initially weak (1-2/5) muscles. Seventy-five percent of these patients were capable of aided community ambulation at 1 year. Very few initially complete quadriplegic patients regained any significant motor function, nor did they achieve community ambulation. Seventy-five

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percent of initially incomplete quadriplegic patients achieved functional strength in initially weak muscles, while 45% achieved aided community ambulation by 1 year. Jorgensen et al reported on motor recovery patterns in hemiplegic stroke patients.⁵ Within the first 2 to 3 months post stroke, 80% to 90% of upper extremity and locomotor recovery occurred. Wade et al showed that although 65% of all hemiplegic stroke patients regained the ability to ambulate, only 40% regained normal walking speeds.⁶ Cohadon et al observed that the time frame for recovery of motor function after traumatic brain injury was quite variable and depended on the severity and nature of the injury.⁷

Many theories have been proposed as to mechanisms of neural recovery. Resolution of local edema and hemorrhage, resolution of diaschisis, neuronal rearrangements, and functional substitution of parallel and/or contralateral pathways have all been proposed. The advent of functional imaging techniques will allow us to better understand the specific mechanisms involved.

The upper motor neuron syndrome is probably the most common cause of locomotor dysfunction resulting from injuries to the brain and spinal cord. A lesion anywhere along its path from the cortex to the spinal cord can result in this syndrome. Corticospinal tract lesions in monkeys result only in difficulties with fine motor control of mostly the distal upper more so than lower extremity. Therefore, it is believed that the full upper motor neuron syndrome is caused by additional injury to parapyramidal pathways such as the corticoreticulospinal tract. The upper motor neuron syndrome clinically consists of distally more so than proximal extremity weakness. Physiological observations include decreased amplitude of agonist activation, slowed activation and inactivation of agonists, as well as inappropriate co-contraction of antagonistic groups. Abnormal supraspinal modulation of spinal motor networks results in defective presynaptic, reciprocal and recurrent inhibition leading to clinical spasticity. In certain patients, exaggerated tonic stretch reflexes result in inappropriate muscle activation during the gait cycle. Most commonly, excessive stretch of the gastrocnemius/soleus complex during mid to late stance results in inappropriate plantar flexor activation during swing.

Attempts at influencing motor recovery by pharmacologic manipulation have come into favor recently. Recent literature has demonstrated a role for central noradrenergic projection systems in motor recovery of iatrogenically induced hemiparesis in rats. Interested readers are referred to reference number 8

for a review of this topic. It appears that the cerebellum is crucial in motor learning and may also be pivotal in aiding motor recovery. Norepinephrine injected into a rat cerebellum facilitates motor recovery in motor cortex-lesioned rats. A onetime oral administration of amphetamine, a norepinephrine releaser and reuptake inhibitor, to motor cortex-lesioned rats improves motor recovery as measured by beam walking. However, this improvement is only seen if physical restraint is not allowed. Also, the coadministration of haloperidol, a dopamine and alpha-adrenergic receptor blocking agent, nullifies the positive effects of the amphetamine. The mechanism for the latter effect appears to be noradrenergic receptor blockade because dopamine receptor agonism has no effect on improving motor function in motor cortex-lesioned rats. Furthermore, gamma-aminobutyric acid (GABA) receptor agonists reinstate the deficits in these rats. A study by Walker-Batson et al demonstrated a clinical and statistically significant improvement in motor outcome in five amphetamines treated hemiparetic stroke patients in comparison to five placebo-treated equally matched hemiparetic stroke patients.⁹

Patients were treated every 4 days with 10 milligrams of amphetamine 30 minutes before physical therapy for 40 days. The significant improvement trends just mentioned continued after discontinuation of drug therapy. Goldstein et al has demonstrated via retrospective analysis in humans that certain drugs were associated with poorer motor and functional outcomes in hemiparetic stroke patients.¹⁰ Such drugs included GABA receptor agonists, dopamine receptor antagonists, alpha-2 adrenergic receptor agonists, and alpha-1 adrenergic receptor antagonists. Animal models have demonstrated a negative effect of amitriptyline on motor recovery possibly because of anticholinergic or adrenergic receptor blocking properties. It appears that there may be a role for amphetamine in the recovery of motor function associated with a stroke and possibly traumatic brain injury-induced hemiparesis. However, studies are preliminary and recommendations for its use in this capacity would be premature. In the meantime, a reasonable strategy would be to avoid medications that tend to have a negative impact on recovery.

Spasticity, as one part of the upper motor neuron syndrome, is common after brain and spinal cord injury. Although physiologic spasticity relates to velocity-dependent passive stretch-induced hypertonia, clinical spasticity involves additional changes in the muscle and connective tissue which tend to make the observed hypertonia less velocity-dependent. Development of the latter nonneural

changes can be minimized by aggressive regular passive range of motion. The mainstay of spasticity management is pharmacologic. The manipulation of altered neurotransmitter function at the level of the spinal cord is the basis behind the observed clinical effects of antispasticity medications. Narcotics, benzodiazepenes, and the GABA-B receptor agonist baclofen tend to alter sensory processing at the spinal cord level, whereas, dantrolene reduces muscle tone by its direct action on skeletal muscle. While all these medications improve spasticity, most also produce significant weakness as an unwanted side effect. Also, these medications rarely alter functional outcome except in patients with severe painful spasms or whose hygiene is hindered by forceful spasms.

Newer medications such as clonidine and tizanidine have received much attention recently because of their positive effect on spasticity and minimal effect on strength decrement. These alpha-2 adrenergic receptor agonists reduce the motor reflex response to extraneous sensory stimuli. In cat models, alpha-2 adrenergic receptor stimulation increases the excitability of the central pattern generator to supraspinal input and allows for better stepping. Cyproheptadine, a serotonin receptor antagonist, has a similar theoretical profile as the alpha-2 adrenergic receptor agonists. Intrathecal administration of baclofen has been used in order to avoid some of the systemic side effects such as sedation. Penn et al showed that intrathecal baclofen reduced spinal spasticity and spasms dramatically without systemic side effects and without a functional decrement.¹¹

The study included traumatic spinal cord injured and multiple sclerosis patients whose spasticity was refractory to oral baclofen. Injectable techniques for spasticity are available, especially for focal hypertonia. Phenol injected into nerve causes focal demyelination or neural degeneration. The potential for permanent effects and painful dysesthesia make this procedure unappealing. Electromyographic guidance is required for best results. A recently introduced agent, botulinum toxin, when injected intramuscularly interferes with acetylcholine release at the neuromuscular junction by interfering with vesicular fusion at the presynaptic membrane. This causes reversible muscle weakness and atrophy for 3 to 6 months. Frequent injections can result in loss of efficacy due to antibotulinum toxin antibody formation. Botulinum is injected with or without electromyographic guidance. Hesse et al demonstrated decreased tone and improved gait velocity after injection of botulinum toxin into triceps surae and tibialis posterior in hemiparetic stroke patients with reflex-induced inappropriate plantar flexor activation.¹² The decision to treat spasticity

should be based on the presence of associated spasm-induced pain or disability. Generalized or multifocal spasticity is best managed with medications, while focal spasticity is best managed with local injections such as botulinum toxin. Mild to moderate functional improvements in the gait of certain spastic patients has been demonstrated only in those treated with targeted local injections of botulinum toxin. Range of motion is mandatory in the prevention as well as treatment of all forms of clinical spasticity.

The approach to the rehabilitation of the patient with a gait deviation due to upper motor neuron dysfunction has recently undergone reevaluation. Conventional rehabilitative methods focus on static and dynamic balance training, weight shifting, and over ground gait training. Newer task-specific methods of training are proving to be more efficacious than conventional techniques at improving locomotor function. Body weight support treadmill training (BWSTT) is a new technique that unloads patients with a motorized harness in order to allow them to walk on a treadmill with assistance. The patterned locomotion that is created by the moving treadmill and the assisting therapist allows for more kinematically normal locomotor patterns, and presumably encourages motor learning and recovery.

Barbeau et al was able to demonstrate improvements in gait speed and weight-bearing in incomplete paraparetic traumatic spinal cord injured patients treated with BWSTT in combination with clonidine or cyproheptadine.¹³ Hesse et al was able to demonstrate improved gait speeds and functional ambulation categories in subacute to chronic hemiparetic stroke patients treated with BWSTT as compared to those treated with conventional gait training methods.¹⁴ Hesse et al demonstrated that functional electrical stimulation was able to restore standing in hemiparetic stroke patients by appropriate activation of gluteus maximus, quadriceps, and hamstring muscles.¹⁵ Carry over was observed after the stimulation. Bogataj et al showed that gait velocity and gait deviations in hemiparetic stroke patients improved faster with electrical stimulation in comparison to conventional gait training.¹⁶ However, these gains began to deteriorate after discontinuation of the therapy. It has also been shown that multichannel functional electrical stimulation can allow paraparetic patients to ambulate with the use of a walker. However, energy costs are high and time to achieve sufficient strength and proficiency to use the equipment is long.

Auditory cueing and electromyographic feedback have been shown to improve hemiparetic limb stance as well as gait kinematics and speed. Many orthoses

can be utilized in order to improve gait kinematics. The most commonly used orthosis in the hemiparetic patient is the ankle-foot-orthosis (AFO). There are many variations of this orthosis, the choice being dependent upon the specific needs of the individual patient. An AFO is generally used to improve foot dorsiflexion during swing as well as knee control during stance. The knee-ankle-foot orthosis can help low level paraplegic spinal cord patients ambulate with a walker. However, the energy costs are high. The reciprocal gait orthosis is more popular and is less energy consuming. The rehabilitation of upper motor neuron gait disorders in the near future will most likely incorporate newer task-specific therapies with conventional rehabilitative strategies in order to achieve optimal functional outcomes.

Parkinsonism can be seen as a result of stroke and traumatic brain injury primarily due to injury to the basal ganglia along with its in and outflow pathways. The clinical features are similar to those seen with Idiopathic Parkinson's Disease (IPD) except for absence of rest tremor, earlier onset of postural instability, and a lesser clinical response to L-dopamine/carbidopa (sinemet). The gait is notable for short steps, shuffling, stooped or erect posture, festination, wide base (unlike IPD), and occasional freezing of a gait. Dopamine receptor agonists can be somewhat helpful for slowness and rigidity, but not postural instability. Rehabilitative strategies shown to be helpful in IPD should also be tried in patients with parkinsonism, especially if postural instability is not a major limiting factor. Auditory cueing has been shown to dramatically modify gait movements and muscle activations in patients with Parkinson's disease. Comella et al demonstrated a positive effect of conditioning, balance training (Tai Chi), ambulation in improving gait speed, and general sense of well-being in Parkinson's disease patients.¹⁷ The combination of physical rehabilitation and pharmacological therapy will most likely yield the best functional outcomes in the management of parkinsonism.

Peripheral or central vestibular dysfunction is a common cause of persistent disequilibrium in the brain injured patient. Brain stem ischemia accounts for the majority of vestibular symptomatology in the stroke patient. Some general vestibular rehabilitation principles have been developed. It is not known whether peripheral dysfunction is more likely to result in better compensation than central dysfunction. Intermittent symptoms such as with Meniere's disease, prevent central compensation, and thus render vestibular rehabilitation ineffective. Symptomatic medications such as benzodiazepenes and

anticholinergic help nausea and vertigo, but actually retard central compensation. Proposed mechanisms behind vestibular rehabilitation include central sensory substitution, rebalancing of tonic activities in central pathways, and physiologic habituation. Common rehabilitative techniques used for general vestibular problems include open and closed eye head exercises, fixation exercises, body positioning maneuvers, and postural/balance training. Benign paroxysmal positioning vertigo, unlike all other vestibular conditions, results from vestibular hyperactivation. Trauma dislodges otolithic crystals which subsequently float down into the ipsilateral posterior semicircular canal. These crystals cause semicircular canal hyperactivation, primarily with the head held horizontally and with the "bad ear" in the down position. Variations of this condition exist. This condition responds well to specific vestibular exercises which are thought to function by dislodging the otolithic crystals. These exercises are the repeated side-lying maneuver, the Epley maneuver, and the Liberator maneuver. Interested readers are referred to reference number 18 for specific details. Vestibular rehabilitation is very effective in improving balance control in many patients. Rehabilitation should be started as soon as disabling nausea has abated. Suppressing symptomatic medications, such as the ones mentioned earlier, should be discontinued as soon as possible in order to prevent prolonged central compensation.

The disorders of balance and gait discussed here are very common after injuries to the brain and spinal cord. Although many other gait deviations can occur as well, current medical and rehabilitative strategies, unfortunately, tend to be less effective. Newer task-specific therapies and targeted pharmacologic agents in conjunction with conventional methods may lead to better functional outcomes for all types of neurological gait disorders. Promising preliminary clinical studies justify further investigation.

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Formulary Development in a USAR CSH: A Team Approach

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Formulary development and utilization must begin and end as a healthcare team effort. From standardization to mission objectives, information gathering is paramount to success. Developing a standard reporting system allows a streamlined approach for understanding the areas of: essential clinical elements, drug characteristics, medical outcomes, therapeutic election analysis, drug review, and finally, decision analysis. A team game play allows intradepartmental discourse, cross-training and educational input, and proper pharmacist utilization.

Introduction

As in all hospital operations, the Pharmacy Formulary stands as the unit's pharmaceutical and therapeutics register. The formulary allows standardization and promises product availability as agreed by the team members of the Pharmacy and Therapeutic Committee (PTC). Members of the PTC, at a minimum, should contain the Chief of Pharmacy, Chief of Professional Services, Hospital Commander, a representative from nursing services, interested clinicians, and a medical logistician, if available. Formulary development must have a team approach and conduct on a periodic basis to ensure an up-to-date operational and efficient mobilization as well as product availability. The unit formulary should be used as a potency and dated item reference.

Formulary development and maintenance are one of the essential responsibilities of the Chief of Pharmacy in any level of pharmacy services whether in a large civilian-based hospital, military combat support hospital (CSH), or area clinic. The rationale for formulary use may be varied from cost containment to system availability. Within this article, we address the many variables that may come into play in how and why we utilize a uniform drug listing (formulary) in its simplest application. A formulary may be a listing of available pharmaceuticals a practitioner has to use in his or her arsenal of drugs.

However, in time, the evolution of formularies has encompassed many variables beyond simply what we have on our shelf today. All medical professionals know that pharmaceuticals are consumables with specific expiration dates (shelf life) requiring special

storage and handling and form a large part of a medical unit basic load. With these presented facts, one understands that a formulary is a living document constantly in flux. A pharmacy manager must rally his medical think tanks to address these changes on a scheduled basis.

Formulary and Pharmacy Objectives. As in all problem solving modalities, we must define our objectives and understand the *WHO*, *WHAT*, and *WHY* of our mission. Once given a mission statement with finite objectives and command guidance, we may proceed to start our development. Our *mission statement* should establish:

- *Priorities* - first mobilize, transport, and establish.
- *Scope of medical practice* - echelon three care.
- *Time constraints* - NLT 26 Sept 1996.

These factors may seem far-reaching from pharmaceutical products but they will affect the problem solving methodology.

Information Gathering. One is unable to produce the correct conclusion without collecting as much pertinent information as possible prior to making any decisions. This corollary holds true to formulary development. Some specific variables in a CSH are:

- *People* - Unit *mission description* based on level of organization, personnel, and equipment allowances, especially focusing on the level of medical personnel assigned and mission deployable.
- *Plan* - *Wartime operations plan* (OPLAN) and support annexes stating specific information as mission and assignments and concept of support.

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- *Time* - Time management concerns to include *time phased force deployment lists* which will specify your unit's probable time and sequence of deployment.

- *Source* - Available *sources of supply* in the theater of operation either during readiness exercises or actual deployments, with considerations for the competitive nature for resources created by multiple unit requests and short suspense dated requisitions (private vendor) contracts as well as supply support activity (SSA).

- *Supply* - Review the *unit assemblages* (UA) products which would be included in health-related field sets, kits, and outfits, in order to identify your unit's Class VIII needs. The UA is the primary source for identifying your formulary items. Scan or check the Common Table of Allowances 8-100 for any and all federal stock codes 6505 (Drugs and Biologicals).

- *Information* - Additional information concerning available pharmaceuticals may be collected from the following:

- the unit's medical catalog

- the Army's master data file

- Medical Assemblage Management Module of TAMMIS

The UA will change periodically and the latest version must be collected to have the correct data in order to develop an up-to-date formulary. Now that we have collected some of the preliminary information concerning our potential formulary, we can proceed to address some of the clinical variables in formulary development. The following checklist will demand input from the clinical staff of the PTC Table 1.¹

Checklist of essential clinical elements that must be addressed developing a CSH formulary:

Essential Clinical Elements In CSH Formulary Development

- *Definition of a Potential Medical Problem:*
 - endemic variables (malaria, heatstroke)
 - quantify and qualify expected casualties
- *Qualify Alternative Pharmaceuticals by:*
 - similar therapeutic index
 - availability of multiple sources
 - cross-reference all essential items by national drug code and national stock number
- *Host Nation Medical Missions as Specified by OPLAN:*
 - explore demographic variables
 - historical medical analysis
 - level of prepositioned pharmaceutical assets
- *Formulary Overall Performance Outcomes:*
 - specific and measurable pharmacy goals
 - OPLANs clinical goals were supported by or limited by pharmacy services
- *Cost Component Analysis:*
 - direct medical cost savings (less costly products of similar therapeutic index)
 - indirect medical cost savings (nursing care, lab cost)

Table 1.

In order to further streamline the clinical drug evaluations in the formulary development, it is essential to review and answer some of the following areas of *drug characteristics* and *medical outcomes* in order to reduce duplications and select the best possible products as displayed in Table 2.

Therapeutic Selection Analysis. Therapeutic selection involves choosing the drug of choice from among alternatives for a certain disease state or medical condition. The goal is to select the agent that provides an acceptable level of effectiveness and is system available.

The ideal drug to select is the one that is least expensive, most effective among alternative agents, and accessible in the military procurement system. The decision process becomes more complicated when the pharmaceutical product of choice is not available because of cost or production limitations. As we further develop a criteria for product selection, we must develop a uniform reporting system to truly establish a common denominator for comparison.

Table 3 is a drug review format for our PTC to review. A listing of UA items specific to pharmacy (6505) were given to our pharmacy technicians. They were requested to generate a report-per-products using the drug review format.³

Now that we have systematically collected and reported all available products, we have reached the final area of formulary selection called decision analysis. *Decision analysis* will take into account the probabilities of event occurring or a goal being achieved.

Final Selection Process. Our final selection process shall employ a process entitled decision analysis. Decision analysis encompasses in a summarized format the information we have collected up to this point and arranges the data in the order placed in Table 4.

- *Drug Characteristics:*
 - routes of administration (by mouth, intravenous, intramuscularly, sublingual)
 - dosing frequency or duration
 - number of federal drug administration approved indications
- *Medical Outcomes:*
 - lower incidence of side effects (nausea, sedation, anticholinergic effects)
 - the need for laboratory monitoring
 - better cure rates for bacterial, fungal, or viral infection
 - better patient compliance factors (duration of therapy, frequency of dosing, taste, and side effect profile)
 - decreased mortality²

Table 2.

Drug Review Report Contained:

- generic name
- proprietary name/manufacture
- therapeutic class
- routes of administration
formulation(s)
- requested by (anesthesiologist requesting a non-UA item)
- pharmacology
- routes of elimination
- efficacy (drugs' ability to achieve its desired effect in a controlled environment)
- side effects/adverse effects
- drug/drug and drug/food interactions
- monitoring parameters
- alternative medications available
- current/expected utilization and cost impact
- availability through SSA
- references cited/used

Table 3.

- Identify the therapeutic or medical problem.
- Define:
 - the perspective
 - the patient population
 - the relevant time frame necessary for receiving product through the military procurement system
- Assessing outcomes with specific primary goals for each decision alternative. A primary usually consists of an easily identifiable and clinically significant desirable therapeutic outcome that relates to the medical or therapeutic problem (primary goal is a life saved, or improvement of chronic disease).
- Listing the therapeutic alternatives under consideration that, with varying degrees of success, could solve the problem by allowing achievement of the primary goal ([Amoxil] amoxicillin vs [Bactrim] sulfamethoxazole/trimethoprin for treatment of otitis media).
- Specify significant secondary events. Examples of secondary events include drug toxicity, noncompliance with a drug regimen, and the need for second or third line options when primary therapy fails.

Table 4.

Decision analysis can be used both for evaluating first, second, and third line therapies or for determining the costs of treating toxicities on adverse events associated with drug therapy. As in all methods of analysis, limitations are present. However, the use of decision analysis has been useful as the final cut on pharmaceutical selections for our CSH.

Conclusion

In many clinical settings, the start of pharmacy services will focus on both the explicit need and request of the physician. By using our team approach to formulary selection, all members of the healthcare team have had the opportunity for input and discourse. The advantage of developing and finalizing the formulary prior to the beginning of an operation allows all members of the PTC as well as the medical supply department to anticipate and become proactive to potential problems and needs. Some of the lessons related to the value of a team-driven formulary system are summarized in Table 6.

Pharmacist intervention based upon product knowledge alone has been, for the most part, underutilized because of dispensing and multiple didactic priorities. Allowing technical support specialists to focus on the dispensing aspects with the pharmacy officers addressing many of the judgmental issues as a formulary development is an optimal vehicle for success.

Definition of Decision Analysis Terminology:

Alternative: Two or more therapeutic options (for example, different drugs designed to solve a medical problem and accomplish the primary goal).

Primary goal: A positive therapeutic endpoint. What one would traditionally consider the main measurement of effectiveness of an alternative.

Secondary event: An undesirable occurrence (for example, side effects associated with a specific therapeutic alternative).

Outcomes: The result achieved when one combines a specific alternative with its primary goal and secondary events. Each alternative can result in several outcomes depending on the number of possible combinations of secondary events.⁴

Table 5.

The Value of a Team-Developed Formulary System:

- improved clinical communications
- a reduction of intrusions on physician time by a propositioned printed reference formulary
- improve therapeutic outcomes because of streamlining
- developing and maintaining a cross level educational program between prescriber and pharmacy
- meeting a perceived need of physician and patient by proper analysis
- enhance the profits of the pharmacy department among physicians by becoming a part of the solution and not the problem

Table 6.

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Sleep Disorders in Operation Desert Storm Veterans

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Excessive daytime sleepiness (EDS), fatigue, and insomnia are complaints frequently reported by individuals who took part in Operation Desert Storm (ODS). We conducted a retrospective chart review of ODS veterans from 30 May 94 through 30 Apr 96 to evaluate the sleep oriented history, nocturnal polysomnogram (nPSG), and the multiple sleep latency test (MSLT) to determine if their complaints were related to commonly recognized sleep disorders. Primary sleep related complaints included EDS-30%, fatigue-22%, snoring-23%, and insomnia-18%.

Introduction

Ninety-five patients were referred for PSGs and MSLTs to the Walter Reed Sleep Disorders Center or The Greater Washington Sleep Disorders Center. The mean age was 35 with 84 males and 11 females studied. All patients completed a sleep history questionnaire prior to diagnostic sleep studies. A diagnostic nPSG was recorded on a standard multichannel 78 Grass Polygraph and a Sensor Medic analysis system. Standard recordings included electroencephalogram (EEG), electro-oculogram (EOG), electrocardiogram (EKG), submental electromyogram (EMG), nasal and oral air flow with thoracic and abdominal effort. On the morning following the nPSG, an MSLT was performed. If the patient had obstructive sleep apnea (OSA), a continuous positive airway pressure (CPAP) titration study was done on a subsequent date. The nPSGs demonstrated fragmented sleep architecture with increased arousals and awakenings in 59% of the subjects. Of the total patients studied, 78 had MSLTs with a mean sleep latency of 6.9 minutes. An MSLT performed in 20 of the 32 OSA patients showed a mean sleep latency of 5.7 minutes. Of these OSA subjects there were 30 males; 22 had EDS, 24 had snoring, 13 complained of fatigue, and five had insomnia. The diagnosis of 12 narcoleptics was primarily based on PSG and MSLT data. Only three of the 12 had a history compatible with cataplexy. Eight patients classified as idiopathic central nervous system (CNS) hypersomnia had shortened total sleep times on the

nPSG. Seventeen of 22 patients with primary snoring had MSLTs done with a mean of 9.8 minutes. A total of 17 patients with symptoms of insomnia had the following diagnoses: 5-OSA, 7-primary snoring, 1-narcolepsy, 1-idiopathic hypersomnia, and 3-psychophysiological insomnia.

With the exception of the subjects with idiopathic hypersomnia and narcolepsy in this selected group of patients, the majority have complaints that are in part explained by commonly recognizable sleep disorders. The use of PSGs and MSLTs without correlation with the clinical history and controlled studies could lead to a misdiagnosis of other sleep disorders in hypersomnulent individuals. Although ODS veterans had multiple complaints, a thorough evaluation of sleep complaints is necessary not only to provide appropriate treatment, but to identify those individuals whose EDS represents a risk to themselves and to other soldiers during deployment and while operating motor vehicles. A diagnosis of EDS was documented for the entire group.

On 2 Aug 90, the U.S. and the Coalition Forces deployed military units to the Persian Gulf region during what was initially known as Operation Desert Shield and later as ODS.¹ In the years following ODS, many veterans have complained of a myriad of medical symptoms that defied classification and are termed The Gulf War Syndrome or The Persian Gulf War Syndrome for the unexplained illnesses among ODS veterans.² In Jun 94, the Department of Defense (DOD) established a Comprehensive Clinical Evaluation Program (CCEP) to evaluate the health of individuals who took part in ODS. By Apr 96, data was available for 18,475 ODS veterans who had completed the CCEP.

The CCEP consists of two phases.³ Phase I evaluations are performed at 84 medical treatment

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facilities featuring a series of questionnaires, a history, physical examination, serum chemistries, complete blood count, and urinalysis. Additional studies and consultations may be performed as clinically indicated. Individuals who warrant or request additional evaluation are referred by an internist or a family practitioner for Phase II at one of 14 regional Medical Centers. Phase II evaluations include more blood tests and mandatory consultations with additional subspecialty evaluation as indicated. Approximately 10% of CCEP participants are referred for Phase II evaluations. Sleep disturbances were the chief complaints for 2% of CCEP participants and were the fifth most common reported from 15 common symptoms.⁴

Blanck et al reported that the Veterans Affairs Gulf War Study Group of 17,248 patients ranked sleep disorder as the seventh most common complaint of its patient population.² The increase in sleep complaints from Blanck's study and the current CCEP reports are unclear and may reflect an increased awareness among Gulf War veterans with the passage of time. There has been considerable controversy in the literature as to the type of sleep disorder in veterans following the Gulf War.²⁻⁵ Gulf War veterans examined under CCEP have a wide variety of symptoms and diagnoses spanning multiple organ systems, not unlike other clinical populations in the U.S. Somewhat higher than expected rates of psychological, musculoskeletal, and common medical conditions, including sleep disturbances, have been seen.^{5,6} Sleep deprivation from combat stress, psychological disorders, and sleep disorders can lead to somatic complaints such as headaches, myalgias, EDS, and cognitive dysfunction.

Johnson and Spinweber identified an association between sleep deprivation and poor performance in a military population.⁷ It is important to accurately diagnose these disorders in order to apply standard therapeutic interventions to improve somatic complaints and prevent future medical problems. The EDS, fatigue, and insomnia are complaints frequently reported by individuals who took part in ODS. This retrospective review evaluated the sleep oriented history, nPSG, and the MSLT to determine if their complaints were related to common sleep disorders.

Methods

The study began 30 Jun 94 and was completed 30 Apr 96. Six hundred and fifty-one cases were referred from Phase I centers for Phase II evaluation at the Walter Reed Army Medical Center (WRAMC) Gulf War Health Center (GWHC). Additional workup included neuropsychological testing and psychiatric

interviews. Unique to WRAMC is a detailed social work history and weekly multidisciplinary discussion of patients. These multidisciplinary groups consist of up to 10 specialists who have assessed the patients from the medical, psychological, and social work perspective. This approach gives WRAMC a very thorough understanding of each patient's symptomatology. Ninety-five of the 651 veterans evaluated by a board-certified internist had valid sleep complaints, not explained by medical or psychiatric conditions. These 95 subjects were sent for nPSGs and MSLTs at either the Walter Reed Sleep Disorders Center or The Greater Washington Sleep Disorders Center (30 subjects). These subjects were not evaluated by a sleep specialist prior to testing. All subjects were evaluated as outpatients at the GWHC for 1 to 3 weeks prior to sleep studies. Drug screening was not routinely done prior to or after nPSGs and MSLTs. All subjects were counseled about sleep hygiene and were advised to get at least 8 hours of sleep for 3 days prior to sleep studies. The PSGs and MSLTs were interpreted by one of three board-certified sleep specialists. The sleep diagnosis given by the sleep center is listed in Table 2.

Primary sleep complaints included EDS, snoring, fatigue, and insomnia. The mean age was 35. There were 84 males. All subjects completed a sleep history questionnaire prior to diagnostic sleep studies. A diagnostic nPSG was recorded on a multichannel 78 Grass polygraph recorder. Standard recordings included EEG, EOG, EKG, submental EMG, and nasal/oral air flow with thoracic and abdominal effort. On the morning following the PSG, an MSLT was performed. The MSLTs were performed according to standard criteria.⁸ If the patient had OSA, a CPAP titration study was done on a subsequent date.

Results

Sleep complaints are listed in Table 1. The nPSGs demonstrated fragmented sleep architecture with increased arousals and awakenings in 59% of the subjects. Of the total patients studied, 78 had MSLTs with a mean sleep latency of 6.9 minutes. Mean sleep latencies were 5.7 minutes. In 20 OSA patients there were 30 males, 24 had a history of EDS, 22 had snoring, 13 complained of fatigue, five had insomnia and five had one or more sleep onset rapid eye movement (SOREMs) on MSLT.

There were eight subjects who were reported to have CNS hypersomnia by the sleep centers. Six subjects had EDS, all eight subjects complained of fatigue, and two reported taking frequent

Symptom	Number	Percent
Excessive daytime sleepiness	28	29.4
Snoring	22	23.2
Fatigue	21	22.1
Insomnia	17	17.9
Miscellaneous	7	7.4

Table 1. Sleep Complaints

nonrefreshing daytime naps. One patient had a history of fibromyalgia and four complained of musculoskeletal complaints. Five of the eight reported that their nocturnal sleep was greater than 8 hours per night and three reported at least 8 hours of nocturnal sleep. The nPSG revealed a mean total sleep time of 338 minutes. The mean number of brief EEG awakenings was 28 with a range from 11 to 33. All eight subjects had a sleep latency of less than 5 minutes with a mean sleep latency of 3.4 minutes and two had SOREMs on MSLT. None of the subjects had sleep disordered breathing.

Of the 12 patients given a diagnosis of narcolepsy, 11 reported EDS, only three gave a history suggestive of cataplexy, and four had two or more auxiliary symptoms. On the nPSG the mean total sleep time for this group was 388 minutes and the mean sleep latency on MSLT was 3.9 minutes (Table 2). All 12 had two or more SOREMs on MSLT. In the parasomnia group,

Sleep Diagnosis	Number
Obstructive Sleep Apnea	5
Primary Snoring	7
Narcolepsy	1
Idiopathic Hypersomnia	1
Psychophysiological Insomnia	3

Table 3. Patients with Insomnia

there were 17 of 22 who had primary snoring with a mean sleep latency of 9.8 minutes. Two had confusional arousals, one had PLMs, and one had a seizure disorder (Table 2).

Among 17 patients with symptoms of insomnia the sleep diagnoses were: 5-OSA, 7-primary snoring, 1-narcolepsy, 1-idiopathic hypersomnia, and 3-psychophysiological insomnia (Table 3). For the entire group, as indicated by MSLT data, EDS was

Diagnosis	Number of Patients
Headaches	20
Somatoform Disorder	16
Somatoform Disorder Undif	7
Depression	15
Low Back Pain	14
Post-Traumatic Stress Disorder	14
Degenerative Joint Disease	12
Dysthymia	11
Irritable Bowel Syndrome	10
Hypertension	9
Tuberculin Converter	9
Asthma	8
Patella Femoral Syndrome	8
Tobacco Abuse	6
Gastrointestinal Esophageal	5
Reflux Disease	
Dermatitis	5
Sinusitis	5

Table 4. Other Diagnoses

Primary Sleep Diagnosis	Number of Patients	Total Sleep (min)	Sleep Efficiency (%)	MSLT Sleep Latency (min)	RDI/hr
Obstructive sleep apnea	32	326	75	5.7*	30.1
Idiopathic Hypersomnia	8	338	90	3.4	1.9
Narcolepsy	12	388	86	3.9	1.9
Primary Snoring	22	392	87.5	9.8**	2.2
Confusional Arousals	2	422	89	7.4	2.0
Periodic Limb Movements	1	400	71	6.8	2.3
Sleep Misperception	2	433	88.5	10.8	0.9
Insufficient Sleep Syndrome	4	263	58	6.2	3.2
Inadequate Sleep Hygiene	3	374	83.5	11.2***	3.3
Depression	1	399	95	4.8	0
Medication	1	399	99	2.0	0
Seizure	1	406	87	10.1	0.4
Psychophysiological Insomnia	3	393	71	9.1	1.2
No Sleep Disorder	3				

MSLT done in *20/32, **17/22, and ***2/3 subjects respectively

Table 2. Mean Sleep Variables

documented. There was no clustering of the various sleep disorders with psychiatric and/or medical conditions listed in Table 4.

Discussion

It was anticipated that complaints such as EDS, snoring, fatigue, and somatic complaints in this group

of individuals would primarily reflect sleep disorders of chronic sleep deprivation, poor sleep hygiene, sleep misperception, and various types of insomnia with a minority of sleep diagnosis such as OSA, narcolepsy, and idiopathic hypersomnia.

Six hundred and fifty-one patients were evaluated from 30 Jun 94 to 30 Apr 96 at the WRAMC GWHC. These subjects reflect a selected group of soldiers who

had waited 3 to 5 years after the Gulf War and whose sleep histories were highly focused prior to referral. The CCEP patients may have up to seven diagnoses upon completion at WRAMC with sleep disorder not necessarily being the primary diagnosis. For the entire group, there were 12 patients with narcolepsy (Table 2). The prevalence of narcolepsy is higher than expected from the database of 651 patients. Bishop et al has documented that as many as 17% of normal subjects can have SOREMs.⁹ Other investigators have shown that cataplexy may not develop for years after the occurrence of EDS.¹⁰ The diagnosis of narcolepsy probably should not be on the basis of MSLT data only.¹¹

There is a very short total sleep time in the subjects with idiopathic hypersomnia and this makes it difficult to evaluate the MSLT data and, thereby, difficult to make an accurate diagnosis. In addition, sleep diaries, drug screens, and adherence to good sleep hygiene is needed prior to sleep studies. Under controlled conditions, the MSLT has been shown to be a useful tool to evaluate EDS.¹² The role of exposure to nerve gas or other toxic agents is still under investigation by the DOD. Human leukocyte antigen was not done in this group of patients. This was not a prospective study and there were no age matched military or civilian controls for comparison. Selection of these specific patients introduces a bias into the sample selection and prevents these data from being generalized to all ODS veterans. In order to generalize beyond this sample, random patients or stratified samples would have to have prospective evaluation and follow-up with a sleep specialist. Table 4 lists other concomitant medical and psychiatric conditions. While it is likely that some of these disorders may have contributed to fragmented sleep, there was no association between the type of medical or psychiatric disorder and the sleep diagnosis.

It is estimated that 40 million adult Americans, 30% to 40% of the population, have some form of sleep disturbance.¹³ Numerous studies have demonstrated the association of sleep disturbances with headaches, neck and back pain, muscular pains, gastrointestinal problems, and mental health conditions in the general population.^{6,14,15} The OSA in the general population has been well-documented.¹⁶

Moore and associates performed PSGs on 24 of 75 consecutive Gulf War veterans.¹⁷ Of the 24 patients studied, 17% complained of EDS. The most common sleep diagnosis was dyssomnia associated with pain in 55%, and psychological insomnia in 39%. Speculation as to why there is such a discrepancy between the studies of ODS veterans is open to

discussion. While our patients with sleep diagnoses had associated psychiatric diagnoses and rheumatologic disorders, there was a higher incidence of serious sleep disorders that required treatment and/or medical separation from the military. Sleep disturbances have been a persistent postwar complaint after all major conflicts the U.S. has been involved in since the time of the Civil War.¹⁸ Newmark and Clayton suggested from their series of 65 CCEP patients that sleep disorders may be under-diagnosed in the active duty population, reflecting previously undetected conditions that pre-dated their Gulf War service.¹⁹

Conclusions

It has been well-documented that sleep deprivation from medical, psychological, and sleep disorders can lead to somatic complaints such as EDS, fatigue, myalgias, headaches, and cognitive dysfunction. Standard therapeutic interventions, including sleep hygiene, medications, and other modalities such as nasal CPAP, can improve somatic complaints and prevent future medical problems. Although many ODS veterans had concomitant psychiatric or medical disorders, a thorough evaluation of sleep complaints is important, not only to provide appropriate treatment but to identify those individuals who represent a risk to themselves and other soldiers during deployment. The EDS could potentially result in accidents while operating motor vehicles. With the exception of the subjects with idiopathic hypersomnia and narcolepsy in this selected group of patients, the majority have complaints that are in part explained by commonly recognizable sleep disorders. The use of PSGs and MSLTs without correlation with the clinical history, evaluation by a sleep specialist, and controlled studies could lead to an incorrect diagnosis in the hypersomnulent patient. For the entire group, EDS was demonstrated.

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Sudden or Traumatic Death in the Emergency Department

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Hartford Hospital, one of the largest medical centers in New England, is an 819-bed major tertiary care healthcare center serving community and statewide needs. The hospital receives 10% of all inpatient activity in Connecticut and has established clinical centers of excellence in the specialty areas of cancer, cardiology, mental health, trauma, and women's health. It is one of the two centers in Connecticut that provides organ and tissue transplantation and is a major provider of cardiovascular surgery. Hartford Hospital has 26 graduate educational programs in affiliation with the University of Connecticut's School of Medicine and Dentistry. The mission of the hospital is to "promote, restore and maintain the health of the people of Connecticut and New England by providing healthcare services of the highest quality."¹

Hartford Hospital is a Level 1 Trauma Center and operates the state's only helicopter transport system. The hospital's Trauma Program was initiated in Sep 83, under the directorship of Dr Lenworth Jacobs. A comprehensive system that included the development of a multidisciplinary team approach to the care of the patient during all phases of trauma, from the time of injury through rehabilitation, was established. Immediate and long-term psychosocial support was included as an integral component in the care of the trauma patient.

It soon became apparent that when a sudden, unexpected and/or traumatic incident occurred, the patient's family also became a "victim." The family was faced with a unique and stressful situation and often their usual coping mechanisms did not prepare them to deal with the stresses and changes in role responsibilities caused by the event. The psychosocial effects of the trauma were as overwhelming and potentially devastating to the family as the physical effects were to the patient.

In 1985, a multidisciplinary committee of nurses, doctors, representatives from social services, pastoral

services, and the community including three bereaved parents was developed to explore the psychosocial needs of the families who had a loved one that suffered a traumatic injury. A telephone survey of 30 trauma centers across the United States was conducted. None of the centers surveyed had an established protocol to provide psychosocial support to the family of a trauma patient or the staff who take care of them. Most of the support was inconsistent and inadequate to meet these needs. A review of the literature revealed many publications on the impact of trauma on the staff and the disruption of the family as a unit, but little was written on the concept of a collaborative team approach to address the psychosocial support of the family and the staff.

The committee surveyed 150 families who were identified from the trauma registry. Of this group, 39% responded and identified the following as needs after their loved one had been involved in a traumatic incident:^{2,3,4}

- arriving safely to the hospital
- being met by someone on arrival
- having a private area to wait
- having someone from the Emergency Department know they were there
- obtaining immediate information and condition reports
- receiving constant updates
- being treated in a caring and compassionate manner by the staff
- learning that everything appropriate had been done for their loved one
- being assured that pain was absent or minimized
- knowing that their loved one did not suffer
- seeing their loved one as soon as possible

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Using the information gathered, the multidisciplinary, collaborative group developed the "Trauma Support Team" (TST) to address the needs of the trauma families. The name of the TST was changed to the "Trauma Support Program" (TSP) in 1993 and its mission statement was updated to read:⁵

"The TSP of Hartford Hospital will meet the ongoing psychosocial needs of trauma patients, their families, and the staff who care for them. This effort will address the immediate and long-term impact of trauma through a multidisciplinary, collaborative, in-hospital support system and referral to community groups' and/or counseling. This program will strive to enhance Hartford Hospital as a caring institution whose concerns extend beyond comprehensive healthcare, to the psychosocial needs of the patient, his or her family and staff."

Based on the mission statement, the following were accepted as objectives of the program:⁶

- To meet the acute and ongoing psychosocial needs of trauma patients and their families on a 24-hour basis.
- To meet the acute and ongoing psychosocial needs of the staff who care for trauma patients and their families to ensure positive morale, effective management of stress, and promote professional growth.
- To increase professional awareness of the TSP through education, research, and publication.
- To enhance Hartford Hospital's image in the community as a caring institution.
- To evaluate the effectiveness of the TSP on an ongoing basis.

To meet the identified needs in the above objectives, it was recommended that a coordinator should be hired to be responsible for the ongoing development of the TSP. A training and orientation program was also implemented to educate the staff about the immediate and inpatient needs of trauma families on a 24-hour basis. Specific attention was paid to the identified needs of the families and staff members were taught to:^{7,8}

- Greet the family upon arrival to the Emergency Department.
- Inform them of their loved one's condition.

- Provide emotional support.
- Answer questions.
- Be sensitive to the religious and cultural diversity of the patients and their families.
- Prepare the family for what they were going to see.
- Allow the family in the room during the resuscitation, if appropriate.
- Orient them to the hospital and introduce them to other staff members.
- In case of a sudden death:
 - continue to support the family and assist those who wish to say "goodbye"
 - explain any postmortem exams that may be necessary
 - work with the organ procurement team to offer the option of organ/tissue donation
- Provide the family with the telephone number of the TSP office in case they have any questions once they leave.

Each member of the TSP has a unique role in the process of patient and family support.⁹ The nurse in the Emergency Department, as the TSP member, is usually the first hospital contact with the patient and is able to initiate the process of support. If the nurse is busy with the physical life-sustaining measures for the patient, the support of the patient's family is delegated to another member of the TSP such as the Coordinator, a case worker, chaplain, or a volunteer. All information concerning the patient is still directed to the primary nurse who communicates with the designated TSP member to frequently update the family on their loved one's condition and disposition. The physician meets with the family as soon as possible to explain in detail what has happened and notifies them in the case of a traumatic death.

The role of the clergy on the TSP is to work with others in assessing the spiritual needs of the patients and families and to initiate supportive efforts in the hospital. During the night shift, the "on-call chaplain" assumes the responsibility of the TSP member and communicates with the primary nurse or designated delegate. The case worker, as part of the TSP, responds to cases identified by the Emergency Department and receives referrals. The emphasis is to provide

continuity of supportive care and assist the patients and families with the psychosocial effects of the trauma.

The TSP, as an in-house support and referral service, was meeting the immediate and inpatient needs of patients and families. However, it soon became apparent that after a traumatic death, the families needed long-term emotional support and referral to resources. The shock was overwhelming to many family members ill-prepared to cope with the devastating and unexpected loss of a loved one. It was determined that the hospital needed to intervene to provide bereavement follow-up care.

The After Care Program (ACP) was then begun in 1987 as part of the TSP.¹⁰⁻¹² The ACP recognizes that grief is a natural and individual response to a loss. It is designed to offer bereavement support for 2 years to family members who have lost a loved one to a sudden, unexpected and/or traumatic death. Also included in the program are the organ and tissue donation families from the Northeast Organ Procurement Organization service area which includes 23 Connecticut hospitals.

Each year approximately 250 patients suffer the sudden, often traumatic death of a loved one in the Emergency Department at Hartford Hospital. "Sudden Death," for the purposes of the ACP, is defined as: "unexpected death which occurs, without warning (or with very brief warning), is not foreseen, and usually leaves the family unprepared for the resultant loss." Examples of sudden death include: traumas, cardiac arrest, drug overdoses, or intracerebral hemorrhage.¹³

Sudden death, resulting from trauma, is the number one cause of death in individuals aged 1 to 44. Very often the families referred to the ACP have suffered the death of a child or younger adult. This type of death can be one of the most significant losses that occurs and the deaths of these patients leave behind hundreds of grieving family members who may not be prepared for the grief they will experience. The symbol of the Trauma Support and ACP is, appropriately, the "butterfly" ... a symbol of hope and new life.

The ACPs philosophy is that by individualized measures of crisis intervention, education about the grief process, emotional support and referral to community resources, the potentially devastating consequences of a sudden or traumatic death with its resultant grief can be minimized and healing/growth can be maximized.

The ACP is staffed by specially trained volunteers who complete an application and interview screening process conducted by the Volunteer Department. The interview focuses on:¹⁴

- The reason for desiring to become an ACP volunteer.
- Past experiences with loss and grief.
- Description of the role and responsibilities of the ACP volunteer.
- Assessment of the following characteristics:
 - active listener
 - sensitive, nonjudgmental, empathetic, compassionate, flexible
 - awareness and understanding of personal issues related to loss
 - understanding of the grief process, especially for families who experience sudden loss
 - awareness of personal limitations
 - commitment to confidentiality
 - commitment to monthly contact with families for a period of 2 years
 - commitment to record keeping
 - has not suffered the death of a loved one in the past 2 years
 - over 18 years of age

The volunteers attend a mandatory 18-hour training session scheduled during the day or evening for the participants.

The training is offered at least twice a year. The ACP volunteer is also required to attend a scheduled annual educational program designed to increase their knowledge and offer the opportunity for small peer group discussion of cases. In addition, professionals are available to offer support, answer questions, and address issues which are pertinent to specific types of loss and responses to that loss. The ACP volunteers have periodic communication with the ACP Coordinator to discuss case loads, evaluate care, and problems associated with families.

The ACP has identified the following support for families based upon the availability of volunteers.^{15,16}

ACP 1 - The family is assigned a volunteer who contacts them at least monthly by telephone and/or mail if the patient was <50 years of age; if the death occurred in the Emergency Department; if the family resides in Connecticut; and/or if the family is referred by the Northeast Organ Procurement Organization.

ACP 2 - The family is assigned to a volunteer who contacts them monthly by mail if the patient was between 50 and 60 years of age; if the death occurred in the Emergency Department; and/or if the family is referred by the Northeast Organ Procurement Organization.

ACP 3 - If the patient and/or family resides outside of Connecticut, they should be referred to local bereavement support where available.

At the time of death in the Emergency Department, a TSP member explains the bereavement support program to the family. The family is provided with packets of information containing a pamphlet that describes the TSP, a pamphlet that offers information which may be helpful to the families in the initial hours and days after the death and suggestions to assist them through the funeral process, a pamphlet entitled: "Coping With Grief," a pamphlet entitled: "Needs During Grief," a resource guide with a bibliography and list of community support groups, and a TSP "butterfly" pin.

A referral form is completed by the TSP member, the TSP coordinator, or a transplant coordinator after the death of the patient. The referral is forwarded to the TSP coordinator who places the family in the appropriate follow-up support program that is based on the previously described criteria. Six predated, computer-generated letters (initial, 3 months, 6 months, 1 year, survey, and 2-year "discharge") are prepared by the TSP clerical volunteer. The referral forms and letters are forwarded to the volunteer ACP Coordinator who assigns a volunteer to the family and initiates a plan of care.

The ACP Coordinator makes the initial contact with the family at approximately 4 weeks following the death. Participation in this program is totally voluntary. A postcard is sent with the initial letter. If the family does not wish to participate in the ACP, they complete and return it and no further correspondence is sent. If the family does not return the postcard, the coordinator assigns a volunteer. A

file is established for each volunteer in the TSP office along with a copy of the family referral form and the volunteer's application.

The volunteer assigned to the family sends a personal "thinking of you" note to indicate that they will be calling the family within the next few weeks. This time frame has been chosen because support from friends and neighbors has often decreased by this time. Telephone numbers for both the TSP and the ACP Coordinators are included in the note so the family may contact either of them at any time a need arises.

Approximately 2 months after the death, the initial call is made to the family. The ACP follow-up bereavement support program is explained to the family and permission is requested to contact them again. All contacts with the families are documented and the information is kept strictly confidential.

The contacts are done from the volunteer's home and require about 1 hour per family per month. Letters and pamphlets are sent periodically to the family members assuring them that what they are feeling is "normal" and part of the grieving process. Special attention is also provided on the holidays, on the deceased member's birthday, on the anniversary of the death, and at other difficult times depending on the needs of the survivors. Each family is followed for a period of 2 years.

Each year, just before the holidays, there is a "gathering" of all families in the program, their volunteers, and the staff who care for trauma victims. The "gathering" is an opportunity for the families to meet their volunteers, the staff who cared for their loved one, and to remember their loved one in a special memorial service. A bereavement expert is the guest speaker who offers suggestions for "getting through the holidays." It is a deeply moving experience for all who participate.

Families are discharged from the program after 2 years. Families may be discharged sooner if they no longer wish to have the follow-up support or if they are unable to be located. Shortly after discharge from the program, a 27-item self-administered survey is sent to each participating family to evaluate and comment on the ACP and its ability to meet the needs of the families. Revisions to the program are based on suggestions offered by the families throughout their care and in response to the surveys.

Findings of recent data analysis indicate that from 1991 to 30 September 1994, 446 families were referred to ACP 1 and 2.¹⁷ Of these families, 11% chose not to

participate. Eighteen percent of the families were unable to be contacted because they had moved, were out of state, mail had been returned, or for other undetermined reasons. Thirty-two percent of the surveys sent to families who participated from 1991 to 1992 have been returned with the following results:

- 78% felt that the initial contact letter was received at the appropriate time.
- 75% felt that monthly support through telephone calls, letters, and notes was frequent enough.
- 75% used all or some of the following words to describe the telephone contact: sensitive, comforting, informative, helpful, and appropriate.
- 3% indicated that the telephone calls were inappropriate and not helpful.
- 56% felt that the notes sent around the time of birthdays, anniversaries, or special days were comforting.
- 72 % indicated that they would not or were uncertain if they would attend a support group at Hartford Hospital if it were provided (When asked what other supports have been helpful in their bereavement, the most frequent response was “friends” and “family members”).
- 31% indicated that they attended the annual “gathering.”
- 90% of those who attended the “gathering” felt better after attending.
- 53% felt support from the ACP should continue for at least 1 to 2 years (We now survey our families at 1 year to determine how long they wish their support to continue).
- 59% would consider supporting another bereaved family at some future time.

Based on our findings, we feel that a bereavement program is an important component of patient and family-centered care. Patients and families should be treated as an entity and support for the family should continue after the death of the patient. Assistance can be offered to them in the form of individualized support, education, and information about the grief process. Also, having access to hospital personnel such as the TSP and/or ACP Coordinator provides the families with centralized resources to assist them once they leave the hospital to obtain such things as medical records, autopsy results, or unclaimed valuables.

As a result of our successful efforts with the families who have a loved one who suffers a sudden and/or traumatic death, the TSP has recently assisted in the development of a bereavement follow-up program that will eventually be hospital-wide. As of Nov 96, any family that experiences the death of a loved one among participating nursing units at Hartford Hospital receives a “bereavement packet” containing information about grief and loss as well as cards and follow-up letters. The packets also contain information individualized to the specific nursing unit. The TSP also addresses the needs of the staff who care for trauma patients through the efforts of its Steering Committee by:¹⁸

- Utilizing a multidisciplinary staff support system that provides caregivers opportunities to express grief and loss.
- Providing formal educational programs to address issues of death and loss as experienced by the caregiver.
- Participating in ways to educate professionals in the proper way to interact with family members who have experienced the sudden and/or unexpected death of a loved one.

Most recently, in 1996, several members of the TSP Steering Committee, along with representatives from other facilities that are part of the Hartford Healthcare Corporation and in conjunction with our Employee Assistance Program (EAP), have participated in the development of an employee crisis response system known as the “Employee Crisis Debriefing Network” (ECDN).¹⁹ The ECDN will provide “defusings” and/or “debriefings” to employees of the Hartford Healthcare Corporation institutions. Defusings and/or debriefings are confidential group sessions that occur within 72 hours after a “critical incident” which affects a person or a group. They are designed to reduce the impact of the incident and accelerate recovery in people who are experiencing normal stress to an abnormal event. A critical incident is any event that is so emotionally overwhelming that it’s impact usually changes a person’s life. It is an event sufficient enough to overwhelm the person’s usual coping skills. These incidents may include but are not limited to the following:²⁰

- sudden death or serious injury
- physical or sexual assault
- violence in the workplace
- abuse, injury, or death of a child

- natural disaster
- terrorist activity
- multiple casualty incident
- any event with high emotional impact

The ECDN is a multidisciplinary, voluntary team whose members are trained and certified in Critical Incident Stress Management (CISM). The CISM is a system of well-integrated interventions that assist a person in coping with abnormal events. The CISM has been used successfully with emergency responders such as police, fire, and emergency medical service providers and is effective in helping a person manage the normal responses to upsetting and difficult situations. The CISM has been shown to be effective in preventing Post-Traumatic Stress Disorder. When applied in the work setting, CISM interventions can help employees recover faster from traumatic, overwhelming incidents which may result in less time off from work and more productive caregivers.

The ECDN system is activated by the manager of the area affected by the incident. Each hospital has a team leader who coordinates utilization of internal ECDN members or requests assistance from other parts of the network. This decision is based on the severity and magnitude of the incident and the number of employees involved. The response is coordinated by the Steering Committee to ensure that the most efficient utilization of resources is sent to the area requesting the services. All information at the defusings and/or debriefings are confidential. In 1996, the ECDN responded to 10 critical incidents that included 16 groups with a total of 347 people being served. Not included in those figures are the "pre" incident educational programs that are done.

Analysis of the effectiveness of the intervention is done through a "Request for Service" form and a "Follow-up Incident" form that are completed by the team leader. In addition, a follow-up survey letter is sent after the incident to the requesting agency contact person for feedback about the service. The ECDN works closely with the EAP. Employees who need further assistance after a defusing and/or debriefing is referred to the EAP, community support groups and/or counseling as appropriate.

The ECDN currently also responds, upon request, to incidents in the community. As with internal requests for service, the team leader receiving the call assesses the event, the number of people involved, intervention required, follow-up support and referral services available, and makes the determination as to

the ECDNs ability to respond. If the incident has occurred outside our geographical area, if the manpower requested is not available and/or is limited, other appropriate resources are suggested to the requesting agency.

Types of requests to incidents in the community have included defusings for employees at a bank after a robbery, for college students after a 21-year-old classmate collapsed while on a treadmill and suffered a fatal cardiac arrest, and for members of the team that responded to a double fatality crash involving an all-terrain vehicle and a train. The same "Request for Service" form and "Follow-up Incident" form are also completed for community incidents as well as a follow-up survey letter. The feedback received has been positive and the efforts of the ECDN appear to be unique and successful as a community "outreach" program.

Summary

Trauma care extends beyond the care of the patient and their family. It must include the staffs who take care of them as well as the community in which they live. A sudden unexpected or traumatic injury, illness, or death often leaves surviving family members ill-prepared to deal with the stresses of the situation. Previous coping skills may be inadequate and feelings of helplessness, hopelessness, and powerlessness may leave the survivors vulnerable. Those of us who work with these patients and their families must be skilled and knowledgeable to manage their care effectively and support them during and after their time of crisis. At the same time, we must be cognizant of our own needs and find ways to effectively manage the stress associated with working with trauma patients and their families to ensure positive morale and promote professional growth.

"It is one of the most beautiful compensations of this life that no man can seriously help another without helping himself."

Ralph Waldo Emerson

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Psychiatric Nursing: A Critical Role in Deployment

MAJ Kathryn M. Gaylord†

During this critical time of downsizing, reorganization, and reengineering it becomes crucial for all of us in the military to prove our worth. Units are being deactivated, medical facilities are closing, and medical specialties are being contracted out to civilian vendors. Cost saving initiatives push us to justify our existence, both in garrison and wartime missions. All branches of the Army, to include the Army Medical Department (AMEDD), have had to decrease their number of authorizations. This has resulted in a closer scrutiny of each specialty. The Army Nurse Corps Branch has deleted and reorganized areas of concentration and skill identifiers. The 66C, or psychiatric nurse specialty, was maintained.

The psychiatric Clinical Nurse Specialist (CNS) is a registered nurse with a master's degree in psychiatric nursing who carries the designator 66C7T in the Army Nurse Corps. This is a nurse with advanced educational training and clinical expertise who has the ability to offer primary psychiatric healthcare based on a wellness-oriented nursing model. The Army Nurse Corps currently has 101 psychiatric nurses and 37 are (CNS).¹ A nurse with the 66C7T designation work in a variety of positions in garrison—in inpatient treatment, consultation/liaison services, outpatient clinics, and administrative positions, however, there are only 31 authorized positions.¹ A FORSCOM assignment may include a position in a combat support hospital (CSH) or a combat stress control (CSC) detachment. The utilization of the CNS in a CSC detachment has proven to be effective.

In Oct 93, five Medical Detachments (CSC) were activated with 23 personnel assigned to each.² Each detachment has one psychiatric CNS assigned in the position of officer in charge (OIC) of the Restoration Unit.² According to doctrine, the psychiatric mental health nurse provides specialized nursing care and management of battle fatigue casualties. This is a natural role and similar to that of a head nurse.

However, the educational background of the CNS enables much more flexibility in the role, from primary care giver to educator to administrator. Positions that I have held in the CSC unit in garrison include commander, executive officer, training officer, clinical supervisor, and counselor. During two deployments, I functioned in the assigned position of OIC, but also as the executive officer, counselor, teacher, and participated in conferences and critical event debriefings. The following scenarios describe and validate the role as a psychiatric CNS during deployments to Guantanamo Bay, Cuba, and Bosnia.

Scenario 1. On 23 Dec 94, I was deployed to Guantanamo Bay Cuba (GTMO) in support of Operation Sea Signal, Task Force 160. I was deployed with elements of the 85th Medical Detachment (CSC) and the psychiatric slice of the 21st CSH from Fort Hood. The 616th Medical Company (CSC) from Fort Gordon was also deployed. The combined mission was to establish mental health services, both inpatient and outpatient, for the Cuban and Haitian refugee population interned on the Navy/Marine base. Two of our personnel worked with the permanent party Navy personnel to provide CSC services for the military personnel. My specific role was to be the OIC of the inpatient psychiatric unit we were to establish. It has a multidisciplinary team of professionals (Figure 1).

SEE PAGE 34 FOR FIG 1



Figure 1.

The deployment, 2 days before Christmas, was in response to the "crisis" occurring on the base. At

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that time, there was a combined population of approximately 30,000 refugees on the base. By the end of January, approximately 10,000 Haitian refugees were repatriated to Haiti. This movement of Haitian refugees was to make room for 10,000 Cuban refugees who were currently interned on other islands and were to be returned to GTMO. The "crisis" was the result of many factors: the refugees had left their native countries in search of freedom only to find themselves interned and even more restricted than before; families were separated and either left behind in Cuba or were waiting in America for their missing loved ones; family members had died at sea, either drowned or eaten by sharks in front of the others; refugees were living with the day-to-day hardships of internment—overcrowding, lack of freedom, lack of privacy, few choices of food, few choices of relaxation; a U.S. policy enabling only medical emergencies to be taken to America, creating many self-abusive attempts to elicit medical care; and the most important factor, no perceived end to their suffering. Until 5 May 95, the refugees believed that they were to be at GTMO for at least 5 years. The "crisis" was relieved on 5 May, when Janet Reno, Secretary of Health, announced a change in U.S. policy that would permit 500 refugees per week to be processed for admittance into America from GTMO and an agreement with Cuba to allow a more liberal immigration of Cubans into the U.S. yearly.

Both the psychiatric inpatient and outpatient units were set up in double hardback tents. Although these tents provided adequate although not optimum space for the outpatient clinic, it became immediately evident that the tents were inadequate for inpatient use. Available buildings were scarce due to the growing needs of the operation, however, the mental health team was offered a building that was a condemned Navy brig. This building offered many amenities not available in the tents: running water, flushing toilets, office space, medication room, closed yard, and the ability to separate and seclude patients if necessary. Although to the outsider, the barbwire reinforced building seemed a somber, severe environment, I saw it as an opportunity to provide a better standard of care and I was excited with creating a "state-of-the-art" facility for our refugee patients (Figure 2).

In my role as OIC, I took on many old and new tasks or adventures as I saw them. The staff was composed of Army, Air Force, Navy, and Cuban nurses. The enlisted staff was composed of all three branches of service and also included military/civilian linguists, military police, shore police, and infantry guards. I was determined to establish an appropriate

SEE PAGE 35 FOR FIG 2

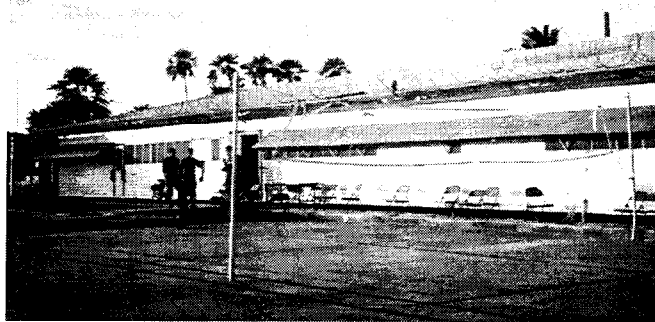


Figure 2.

standard of care that everyone could understand and follow. It was important to meet the individual needs of our patients and varied staff, who were at different levels of experience and education.

There were many obstacles to our success, but I believe that overall, we were successful. We admitted our first refugee patient on 26 Dec 95. Our census grew to a high of 57, but we normally maintained a census of 14. We admitted 147 Cuban or Haitian patients in the 6 months of my deployment. Active duty military were not admitted to our facility. They stayed briefly at the Navy Hospital until they were evacuated to the U.S. The refugee patients were stabilized and returned to their assigned camps. The patients were either Spanish speaking Cubans or French-Creole speaking Haitians. Most of the staff spoke neither language, and relied heavily on the linguists. The linguists varied in both language and psychiatric skills. They had to be taught to interpret all communication, not just the words. The patient population included chronic adults, forensic adults, adolescents, males and females; a standard not present in any American facility, at least not in one large room. It became a challenge to provide an individualized treatment plan while ensuring privacy and safety for all.

The environment was a major issue. Minimal assistance was provided by the base, as this was a condemned building. Partitions, safety doors, and ramps were constructed from plywood. New screens were placed on the windows. A nurse observation desk was built to my specifications. I was able to utilize a team of Cuban refugees to assist in the remodeling. They completely painted the inside of the building with paint I had secured from salvage and installed wooden cabinets that I obtained from condemned housing. A guard observation room was remodeled

into a locked medication room (Figure 3). They worked for 5 months without pay—for just the opportunity to be productive. The occupational therapy (OT) and nursing staff worked together to upgrade the yard with plants and a garden.

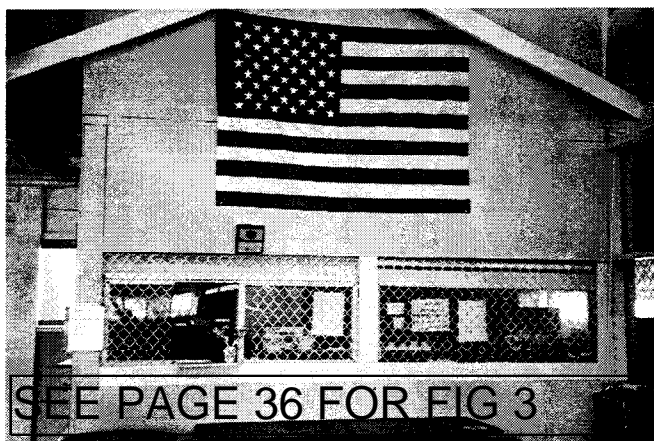


Figure 3.

There were the usual administrative tasks—scheduling, logistics, and meetings. Working together with the wardmaster was critical since he ensured that the details of planning came to fruition. Finally, it was important to create a sense of esprit de corps so that all of the staff worked toward a positive outcome, not only for the refugee patients in our care, but for the military who were deployed.

Scenario 2. On 27 Dec 95, I was deployed to Bosnia-Herzegovina in support of Operation Joint Endeavor, Task Force Eagle. I was deployed with my unit of assignment, the 84th Medical Detachment (CSC) from Fort Carson. The mission was to provide mental health services, along with Division Mental Health Services, to the 10,000 soldiers in the area of operations. This was the first deployment of a complete CSC detachment, to include the Restoration Unit (Figure 4). My role was the OIC of the Restoration Unit as dictated by CSC doctrine.³

An attempt was made to follow doctrine as much as possible. The U.S. Implementation Force was spread out in 26 base camps. Figure 5 shows the author at Lukavac, Bosnia, that was used for the CSC Restoration Unit located in an abandoned oil refinery. The 84th established Headquarters and the Restoration Unit at camp Lukavac and the three Prevention teams were sent forward to camps, Gradacac, Molly, and Comanche. Headquarters was manned by the commander, detachment sergeant, operations sergeant, and clerk. The Restoration team included myself, the OT, the wardmaster, ward clerk, and five behavioral



Figure 4.

science specialists, psychiatric technicians, or OT aides. Figure 6 shows SSG Teich (left), Restoration Unit Wardmaster, SFC Nugin (center), Detachment Sergeant, and the author (right) in front of a bunker at Guardian Base, Bosnia. The Prevention teams were manned by one psychiatrist, a social worker, and two behavioral science technicians. One of the Prevention teams was led by the unit psychologist.

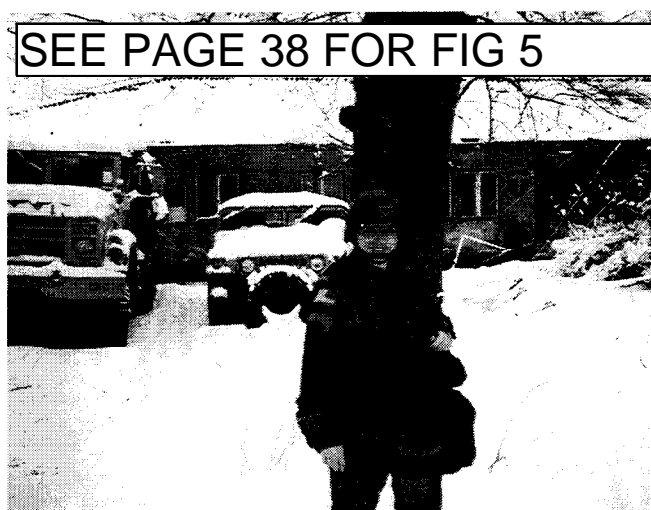


Figure 5.

The Restoration Unit was operational in 5 days when we admitted our first soldier. During the 1 year Deployment, 123 soldiers were admitted with 105 returned to duty or 85%. Soldiers were admitted for 3 to 7 days with an average length of stay of 6 days. The restoration program followed doctrine as much as possible utilizing the “4-R’s” which are rest, restore physiologic status, reassurance of normalcy, and expect a return to duty. Communication assets in-theater were not always optimal, so efforts to transport soldiers to and from the facility was sometimes a challenge. However, everyone worked together to



SEE PAGE 39 FOR FIG 6

Figure 6.

overcome this obstacle. Both the Prevention teams and Division Mental Health teams followed the CSC doctrine to refer their soldiers to the Restoration Unit. Once the soldiers were returned to duty, these teams would provide follow-up mental health services.

As OIC of the Restoration Unit, I faced challenges similar to those of a head nurse of an inpatient unit—staffing, scheduling of personnel, providing direct clinical services for the soldiers in my care, and overseeing the restoration program. Since we were co-located with CSC headquarters, the operations sergeant coordinated the logistic support necessary to transport the soldiers to and from the Restoration Unit. The wardmaster attended to those day-to-day details that ensured smooth running of the unit. The OT developed and ran the stress program, an integral part of the program. The psychiatric technicians, behavioral science specialists, and OT aides provided the 1:1 clinical support.

One of the main roles of the CNS in a Restoration Unit is collaboration with the admitting psychiatrists to ensure that soldiers receive the optimum care

needed. This was the most rewarding, yet challenging role of the deployment. The role of the CNS, especially in the CSC detachment, is not always understood by either professional or nonprofessional personnel. Once this role is understood and accepted, through education and patience, the CNS will be utilized to their maximum capacity. I believe that the role of the CNS, as cited in FM 8-51, provides for the optimum utilization of all the professional personnel.

Overall, the use of the Restoration Unit in the peacekeeping mission was a success. The main limitation was the tendency to create a psychiatric inpatient unit with a therapeutic milieu, instead of a simple stress center. This occurred in an attempt to minimize psychiatric evacuations out of theater. Although there are many similarities, especially in administration, a Restoration Unit is not intended to be an inpatient unit and is not staffed for the comprehensive treatment of neuropsychiatric disorders. The doctrine, as stated in FM 8-91, is effective in meeting the mission. The variation of doctrine was also effective, but not without adjustments to staffing and philosophy.

Summary

The psychiatric CNS (66C7T) has proven to be a valuable asset to the AMEDD. The Medical Reengineering Initiative (1997) is establishing how and where the AMEDD will operate in the future. The in-depth educational background and clinical skills enables the psychiatric CNS to easily adapt to multifaceted roles, including those in deployment. The psychiatric CNS is here to stay.

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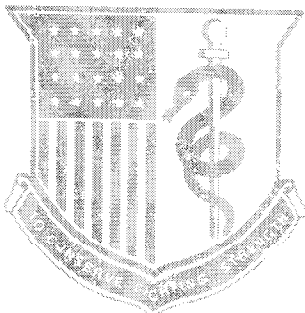


Figure 1 From Page 30



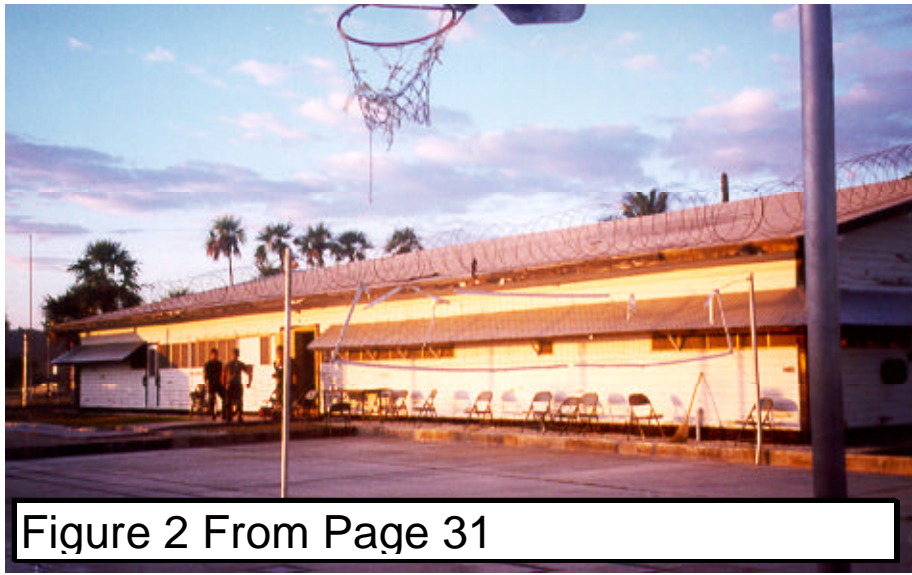


Figure 2 From Page 31

Figure 3 From Page 32





Figure 4 From Page 32

Figure 5 From Page 32

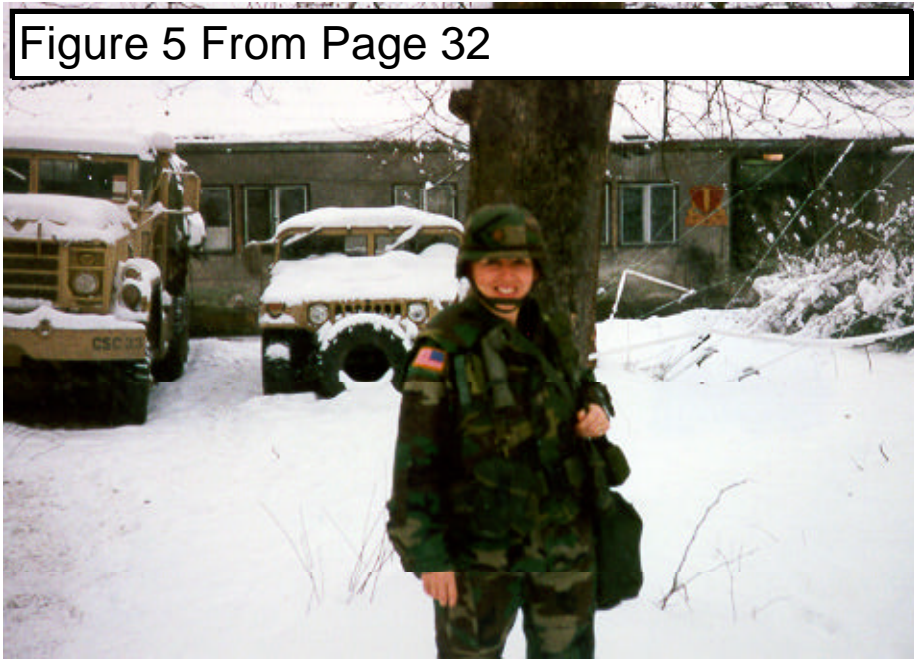




Figure 6 From Page 33

Pretesting and Success in the Respiratory Specialist Course

LTC Donald Gebhart[†]
MAJ William Grimes^{††}
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The Respiratory Specialist (91V) course maintains one of the highest attrition rates among courses taught at the Army Medical Department Center and School (AMEDDC&S). The 91V course is divided into two phases: didactic and clinical. Students failing the didactic phase cost the Department of Defense (DOD) approximately \$900,000 each year. The purpose of this study is to examine the nature of the relationship between three cognitive variables: skilled technical (ST) score, general technical (GT) score, and pretest score, with the didactic phase final grade. A retrospective, correlational study examined a random sample of 91 records of students enrolled in the 91V course during fiscal years (FY) 93-95. Using the Pearson correlation coefficient, a moderate correlation was found between each of the three cognitive variables and the didactic phase final grade. The strongest correlation was found between the pretest score and the didactic phase final grade. Incorporation of the pretest score into the selection process could result in a reduction in the attrition rate of the 91V course.

Introduction

The purpose of this study is to determine if there is a relationship between an individual's ST, GT, or pretest scores and the didactic phase final grade in the 91V course. If a relationship can be established between these cognitive variables and a student's didactic phase success, the DOD could use these variables as predictors for screening future applicants.

History

A 91V is an individual trained to administer aerosol therapy, ventilator management, oxygen therapy, airway management, and cardiopulmonary physiology. In 1972, primarily because of a critical shortage of 91Vs in the military, and no service school for producing the speciality, the Army documented a need for a training course. In 1974, the Office of The

Surgeon General approved a 30-week course conducted at Brooke Army Medical Center (BAMC). The first course began in 1975 with 25 students and used equipment donated by product representatives (conversation with O'Hora, October 1996).

In 1987, the school divided the 91V course into two phases. The didactic phase includes 16 weeks of intense academic training where students normally experience difficulties which contributes to the high attrition rate. The didactic phase is staffed with 10 enlisted instructors and the program director. The clinical phase, also 16 weeks, is conducted at BAMC. It is staffed by nine enlisted instructors, four civilian instructors, and a clinical education coordinator. The clinical phase consists of six training rotations: four intensive care rotations (medical, surgical, Institutes of Surgical Research [burn], and the newborn intensive care unit), a pulmonary functions rotation, and a rotation on various patient wards (conversation with O'Hora, October 1996).

Approximately 190 students from the Active Army, Navy, Army Reserve, and Army National Guard start the course, and 100 to 130 graduate each year (conversation with O'Hora, November 1996). After successful completion of the course, graduates are eligible to take the National Board of Respiratory Care certification examination. Graduates also receive 32 semester hours of college credit which can be applied toward an Associate's Degree (conversation with O'Hora, October 1996).

All of the coauthors are in the resident phase of the U.S. Army-Baylor University Graduate Program in Health Care Administration, Academy of Health Sciences, U.S. Army Medical Department Center and School:

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Significance of the Study

The 91V course maintains one of the highest attrition rates among courses taught at the AMEDDC&S (conversation with Lesjak, September 1996). The attrition rate for the didactic phase ranged from 27% to 48% during the three FYs studied, (Table 1) while the clinical phase attrition rate during the

same period was less than 1% (conversation with O'Hora, October 1996). One reason for the high attrition rate is the compressed duration of the course (conversation with O'Hora, October 1996). The course taught at the AMEDDC&S is completed in approximately 8 months whereas its civilian counterpart completes the same requirements over a 2-year period. If a strong relationship can be

DATA	1993	1994	1995	TOTAL
number (n)	29	32	30	91
Gender				
Male	23	22	24	69
Female	6	10	6	22
ST Score				
Mean	112.48	108.41	115.50	112.04
SD	11.91	8.38	9.72	10.35
Range	95-131	97-130	95-130	95-131
GT Score				
Mean	110.55	108.47	113.40	110.76
SD	10.09	9.48	9.76	9.92
Range	92-129	94-128	96-129	92-129
Pretest Score				
Mean	62.59	61.13	66.33	63.31
SD	16.26	19.13	16.23	17.26
Range	23-95	23-99	15-92	15-99
Didactic Final Grade				
Mean	74.07	75.98	80.90	77.00
SD	16.69	16.34	12.80	15.48
Range	49-94	27-96	52-96	27-96
Pass	15	18	22	55
Percent Pass	51.70	56.25	73.30	60.40
Fail	14	14	8	36
Percent Fail	48.30	43.75	26.70	39.60

Table 1. Descriptive Data for Sample by Fiscal Year and Total

demonstrated between the three cognitive variables (GT, ST, and pretest scores) and the didactic phase final grade, the current prerequisite test scores can be considered for adjustment to provide a more accurate indicator of success in the didactic phase (conversation with O'Hora, October 1996).

Reliable success indicators in the didactic phase of the 91V course are vital to the DOD for several reasons. In FY 95, the DOD spent an average of \$20,727 per student or approximately \$2,694,510 annually to conduct the 91V course. The per student cost includes transportation costs, housing, pay and allowances, instructor costs, training materials, training facility maintenance, and other direct and indirect costs (AMEDDC&S FY 95 Course Cost Analysis, Course Number 300-91V10). Currently, the majority of unsuccessful didactic phase 91V students are terminated in the 8th week of the 32-week course after an average of \$13,299 has already been invested in the student (conversation with O'Hora, November 1996). If these failure rates can be reduced, the DOD could save approximately \$891,033 annually (AMEDDC&S FY 95 Course Cost Analysis, Course Number 300-91V10).

In a time of downsizing and decreased budgets, it is vital to the DOD to ensure the money it spends training an individual produces the intended result. From both a readiness and cost perspective, it is necessary to reduce the attrition rate of this course. If factors can be found that would predict the didactic phase success of soldiers, these factors could then be applied to provide a more accurate indicator of success in the didactic phase.

Research Questions

In conducting this study, three research questions were posed:

- What is the relationship between a student's ST score and the didactic phase final grade in the 91V course?
- What is the relationship between a student's GT score and the didactic phase final grade in the 91V course?
- What is the relationship between a student's pretest score and the didactic phase final grade in the 91V course?

Variables

The primary independent variables used to evaluate the proposed relationship were: ST and GT scores, and

the 91V pretest score. The ST and GT scores originated from the Armed Services Vocational Aptitude Battery (ASVAB) which measures an applicant's general trainability.¹ Since each enlisted member of the Armed Services is administered the ASVAB within 2 years of enlistment, these scores are a reliable measure of the Armed Services enlisted population's achievement in the ST and GT aptitude areas. The ASVAB test scores were obtained from the Army Training Requirements and Resources System (ATRRS). The pretest scores were obtained from an examination given during the first week of training to all students enrolled in the 91V course. The pretest measures the students' general knowledge of mathematics (conversation with O'Hora, October 1996).

The dependent variable in this study was the didactic phase final grade in the 91V course. A passing grade, 70 out of a possible 100 points, and successful completion of the clinical phase entitles the student to be awarded the 91V identifier (conversation with O'Hora, October 1996). Within the scope of the study, each variable can be defined conceptually and operationally.²

ST Score.

Conceptual Definition: The score of the ST aptitude area of the ASVAB measures general science, mathematics knowledge, mechanical comprehension, word knowledge, and paragraph comprehension (conversation with Rivers-Hencke, October 1996). The current minimum score for enrollment in the 91V course is 105 (conversation with O'Hora, October 1996).

Operational Definition: An ST score is a numerical value between 40 and 139 which represents the ST aptitude area of the ASVAB (conversation with Rivers-Hencke, October 1996). The mean ST scores evaluated were taken from ATRRS data of a random sample of students who attended the 91V course during FY 93-95.

GT Score.

Conceptual Definition: The score of the GT aptitude area of the ASVAB measures arithmetic reasoning, word knowledge (vocabulary), and paragraph comprehension (conversation with Rivers-Hencke, October 1996). The current minimum score for enrollment in the 91V course is 105 (conversation with O'Hora, October 1996).

Operational Definition: A GT score is a numerical value between 42 and 130 which represents the GT

aptitude area of the ASVAB. The mean GT scores evaluated were obtained from ATRRS data of a random sample of students who attended the 91V course during FY 93-95.

Pretest Score.

Conceptual Definition: The pretest is given to all entering 91V students during their first week of training. According to the course director, this test evaluates the student's general knowledge of material to be presented during the course. The emphasis of the pretest is to measure the student's general knowledge of mathematics. The current minimum score for passing the pretest is 70 (conversation with O'Hora, October 1996).

Operational Definition: A pretest score is a numerical value between zero and 100. The mean pretest scores evaluated were obtained from a random sample of students who attended the 91V course during FY 93-95.

Didactic Phase Final Grade.

Conceptual Definition: The didactic phase final grade is a mathematical average of all didactic phase module test scores. The current minimum score for passing the didactic phase is 70 (conversation with O'Hora, October 1996).

Operational Definition: A didactic phase final grade is a numerical value between zero and 100. The mean didactic phase final grade scores evaluated were obtained from a random sample of students who attended the 91V course during FY 93-95.

The variables identified for study are important because the ASVAB scores are currently being used by the Department of the Army to predict success in training programs. For example, the ASVAB establishes qualifications for assignment to specific skills training based on scores in various aptitude areas.¹

The goal of this study was to examine course data and ASVAB test scores for FY 93-95 from randomly sampled 91V didactic phase student records in an attempt to identify relationships surrounding success in the 91V didactic phase.

Limitations and Assumptions

Perhaps the greatest limitation of this study was that it used observational data. Although this did not

allow manipulation of the variables, it provided a cost-effective "first look" for the course director. Additionally, the assumption was made that all students placed the same importance on the pretest and exerted their effort accordingly. Currently, however, there are no repercussions associated with poor performance on the pretest. It is possible that an equal effort was not expended by all.

Literature Review

Although, there were no studies that specifically addressed assessment of applicants prior to attending the 91V course, a wealth of studies exist that attempt to predict academic performance. Studies have been conducted that attempt to find a relationship between academic success and a variety of variables that include Medical College Admission Test (MCAT) scores, institutional selectivity, prior grade point average (GPA), ethnicity, personality and learning style, subgroup modeling, and previous course selection.³⁻⁹

The preponderance of studies on performance in the medical arena focused on the most costly and competitive field: the physician. The evidence from these studies suggests that academic success cannot be predicted based on any single variable. However, several studies suggested that a combination of variables could offer a prediction of future performance. Hall and Bailey found that combining MCAT scores, undergraduate performance, and college selectivity provided a useful tool in predicting the first year success of a medical student.³ Rolfe et al argue that the breadth of undergraduate education (to include social sciences) produced better medical students.⁹

Baker et al found that noncognitive profiles that assessed personality, learning style, and other neuropsychological factors were much needed augmentations to cognitive profiles in order to predict the success of anesthesiology residents.⁷ Erdmann et al contend that assessment profiles of any kind are not sufficient, but that these profiles must be evaluated by subgroup (age, gender) populations in order to provide any real predictive validity.⁸

No studies specifically address the performance of 91Vs. However, those reviewed provide evidence that a relationship does exist, to some extent, between cognitive testing and academic performance.

The purpose of the study then, is not to replicate the work of these previous studies in order to assess its

application to 91Vs. Instead, it is to determine the nature of the relationship between three specific cognitive variables (GT, ST, and pretest scores) and the didactic phase final grade in an attempt to more clearly understand success in the 91V course didactic phase.

Methods

Design. The study was a retrospective, correlational study, involving secondary data analysis of the didactic phase final grades and cognitive test scores maintained by the course director and/or recorded in ATRRS.^{2,10}

Sample. A random sample of 91 (n=91) records of students enrolled in the 91V course during FY 93-95 was taken from a total accessible population of 424. The random sample was obtained by using a random number generator on a hand-held calculator to determine a starting point, and then subsequently selecting every 4th student record. Student records with missing test scores (ST, GT, or pretest) or didactic phase final grades were not included in the study. Also, records of students dismissed from the course for other than academic failure were not included.

Reliability and Validity. One investigator entered all of the student data from the ATRRS records and from the course director's records into an electronic database. A second investigator verified that the data was correctly entered into the four fields of the database (ST and GT scores from ATRRS, pretest scores, and didactic phase final grades from the course director's records). The reliability of the data transfer was confirmed by the second investigator who determined that 99.25% of the data had been accurately entered into the four fields of the database. The face validity of the data was estimated by the course director who directly compared 100% of the data fields taken from the ATRRS records with his 91V records for FY 93-95.

Data Collection. The 91V course director provided students' pretest scores, didactic phase final grades, and military status. The ST and GT scores, and gender data were obtained from ATRRS printouts for selected students for FY 93-95. Data was collected at the following three levels: nominal (gender and military status), interval (ST and GT scores), and ratio (pretest scores and didactic phase final grades).

The 91V course director gave consent to use data from student records in this study. Since student names and social security numbers were matched with scores and grades in the database, efforts were made to protect the privacy of the students. Access to the database was

limited to the course director and the four researchers during the study. The names and social security numbers were destroyed when the study concluded.

Results

Ninety-one randomly selected records of students who attended the 91V course didactic phase during FY 93-95 were included in the study. The four variables examined from each record are: ST, GT, and pretest scores, and didactic phase final grade. Table 1 displays the data by fiscal year and by variable.

A Pearson correlation coefficient, using a level of significance of $\alpha=.05$, was performed to determine the nature of the relationship between ST, GT, and pretest scores and the didactic phase final grade. Since the data being analyzed was interval or ratio data, a parametric statistical analysis, in this case a Pearson correlation coefficient, could be used. Parametric statistical analysis is preferable to nonparametric analysis because it is more powerful and more sensitive.¹¹ A moderate correlation was found between each independent variable (ST, GT, and pretest scores) and the dependent variable (didactic phase final grade). The strongest correlation ($r=0.481$, $P<.000$) was between the pretest score and the didactic phase final grade. The correlation of the ST and GT scores to the didactic phase final grade was $r=0.380$ and $r=0.370$ respectively with $P<.000$. All three of these correlations were significant (Table 2).

Variables	Correlation with Didactic Phase Final Grade
Pretest Score	0.481*
ST Score	0.380*
GT Score	0.370*
	* $P<.000$
	Pearson r

Table 2. Correlations Between Didactic Phase Final Grade and Pretest, ST, and GT Scores

Discussion

Although no previous studies have been conducted on the 91V program, the findings from this study parallel those found in research of medical students.

Several studies of medical students suggest that cognitive testing can serve as a predictive tool for future academic performance.^{3,12} This study of 91Vs also suggests that there is a moderately strong, significant relationship between cognitive test scores and academic performance.

However, other studies argue that noncognitive variables such as undergraduate education choices, personality and learning style, and ethnicity offered stronger correlations.^{6,7,9} The course director of the 91V course acknowledged that there were noncognitive variables that may affect course performance and therefore, the outcome of this study. These included maturity, attitude towards curriculum, study group cohesiveness, pre-exposure to course material, and the student's professional goals (conversation with O'Hora, November 1996).

Conclusions

The results of this study indicate that there is a moderate and statistically significant correlation between each of the independent variables and the didactic phase final grade. While each of the correlations were moderate, the correlation between the pretest score and the didactic phase final grade had a slightly higher *r* value.

Several studies of medical students recommend that cognitive test scores be used as a tool for screening applicants.^{3,12} The correlation between the independent variables and didactic phase success suggests that these scores could be used as a similar screening tool in the 91V course.

Currently, the pretest is administered to 91V students after they have relocated to Fort Sam Houston and have been in the course for approximately 1 week (conversation with O'Hora, November 1996). Further research should be conducted to establish a specific pretest score that improves a student's probability for success. That pretest score could then be incorporated into the selection process. Additionally, research on the relationship between noncognitive variables, such

as maturity, attitude towards curriculum, and academic success should be explored. This additional research may identify other factors which predict success in the didactic phase of the course.

These conclusions suggest that a student's pretest score serves as a factor for understanding academic success. Incorporation of this factor into the selection process could result in a more appropriate identification of students and a subsequent reduction in the current 91V course didactic phase attrition rate. Modification of the selection process could reduce current losses and enhance readiness.

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AMEDD Dateline

Dr Wayne R. Austerman†

- 1 Mar Congress established the Hospital Corps, consisting of hospital stewards and privates as part of the AMEDD. This marked the origin of a formal career field for enlisted personnel in the department. (1887)
- 3 Mar An Act of Congress established a U.S. Army Dental Corps staffed by commissioned officers. (1911)
- 6 Mar Surveying the bodies of an estimated 70 dead and 300 wounded Mexican casualties incurred during the final assault on the Alamo, General Santa Anna remarked that “the lives of our soldiers must be regarded as those of so many chickens.” The Mexican Army lacked any organized field medical support system at that time and many of the wounded died of shock, blood loss, and infection in the following weeks. (1836)
- 15 Mar Mrs Dita H. Kinney, a former civilian contract nurse, was officially appointed as the first Superintendent of the Army Nurse Corps. (1901)
- 18 Mar Lady Mary Montague, wife of the British ambassador to Turkey, observed the native practice of inoculation against smallpox, and on this date had her own child immunized against the disease by the method of applying infected matter to a gash in the skin. She later took the knowledge of this practice home to England, where it was successfully tested on condemned criminals and subsequently adopted by the royal family. (1718)
- 21 Mar Doctor Helen E. Myers became the first female dentist commissioned into the Army Dental Corps Reserve. She was activated for a 2-year tour of duty at Fort Lee, VA. (1951)
- 27 Mar Approximately 350 Texan prisoners of war were executed at Goliad, 100 miles southeast of San Antonio, on the orders of General Santa Anna. Only physicians and medical stewards were spared from death. They were sent to San Antonio to treat the Mexican wounded still surviving since the assault on the Alamo. Among them were Dr Benjamin Harrison, the son and uncle of two future Presidents of the United States. (1836)
- 2 Apr Doctor James Tilton, The Surgeon General, directed hospital surgeons to begin the practice of recording daily weather observations at their posts. This marked the origin of systematic meteorologic observations in the U.S. (1814)
- 6 Apr Union and Confederate forces clashed at the Battle of Shiloh in southern Tennessee, producing more than 23,000 casualties in 2 days of fighting. This was the largest mass casualty situation in American history to date. The Confederate commander, Albert Sidney Johnston, bled to death from a leg wound suffered on that morning while his own headquarters staff surgeon was absent, tending Union casualties. Union commander Ulysses S. Grant managed to narrowly avert defeat after being taken by surprise, but faced criticism based upon his prewar reputation for alcohol abuse. (1862)

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- 12 Apr American Civil War began when Confederate forces shelled Fort Sumter at Charleston, SC. No casualties were sustained during the bombardment, but one soldier was fatally wounded when a gun exploded as a salute was fired to the lowering of the colors after the post was forced to surrender. Surgeon Samuel Crawford treated the first of 620,000 men to die of wounds or disease in that conflict. Crawford had earlier treated a Confederate officer who had fallen ill while visiting the fort during a truce to discuss possible surrender terms. Doctor Crawford thus bore the distinction of having treated the first Union and Confederate casualties of the war. He later abandoned his medical duties to reach general's rank while serving as a line officer. **(1861)**
- 14 Apr Congress authorized the creation of a U.S. Army Medical Department, which was to be headed by a Surgeon General. This act marked the beginning of the modern U.S. Army Medical Department. **(1818)**
- 21 Apr General Sam Houston's Army of the Republic of Texas surprised and defeated a force of 1,200 Mexican troops at San Jacinto, near what is now the city of Houston. Mexican commander Santa Anna, an opium addict, was dozing in his tent at the time of Houston's attack. **(1836)**
- 24 Apr The Division of Dentistry, Walter Reed Institute of Research, introduced the use of closed-circuit television as a teaching aid for dental education. **(1957)**
- 25 Apr First use of the guillotine as an instrument of capital punishment. Designed by Dr Joseph Guillotine as a swift and humane means of execution, the first such device was built by Tobias Schmidt, a German harpsichord maker. **(1792)**

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